THE IRON AGE

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Reading Matter Contents.....page 1711
Alphabetical Index to Advertisers " 167
Classified List of Advertisers.... " 159
Advertising and Subscription Rates " 166

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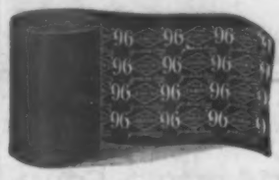

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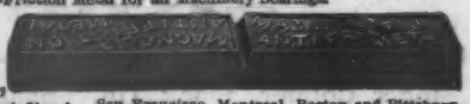

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THE IRON AGE

New York, Thursday, May 25, 1905.

Motor Drives in the Plant of the John Simmons Company.

About a year ago the John Simmons Company, 110 Centre street, New York City, built a new addition to its plant about 7500 square feet in area and six stories high. This section is occupied mainly by tools for work on large pipe and steel and iron fittings. In all cases it was the main object to make the machines capable of using high speed steel tools and to this end motors have been employed one to each tool, inasmuch as it was not practicable to pull the heavy cuts which the tools are capable of when belt drive is resorted to. A number of the combinations are of special interest and are shown in the several accompanying illustrations, a description of each of which will be given.

In spite of the fact that the works have been considerably enlarged, the substitution of individual motor drive for shaft drive has made it possible to install a generating plant of smaller capacity than was formerly required. Originally the power plant contained two engines with a combined horse-power of 225. The new equipment consists of a 150 horse-power direct connected set, the engine being furnished by the New York Safety Power Company and the generator by the General Electric Company. The latter supplies current at 240 volts and has a capacity of 100 kw. This set is used for furnishing light and power to the whole building. The current is distributed over a multiple voltage system using a Crocker-Wheeler three-unit balancer. This is a four-wire system from which six voltages are available, from 40 to the total voltage of the line, increasing in the intermediate steps by increments of 40 volts. Steam is supplied by two 250 horse-power Edgar water tube boilers. These replace two 60 horse-power boilers in the old plant. The exhaust steam is used for heating with the addition of sufficient live steam in the severest weather to make up the required amount. The returns from the heating system form the feed for the boilers and are passed through a 500 horse-power Cochrane feed water heater and filter. There are three feed pumps of Worthington make, and in addition a house pump and fire pump. Water for all but drinking is taken from an artesian well and is used in the sprinkler system, for washing purposes and in the plumbing fixtures.

The largest lathe in the shop is shown in Fig. 1. This lathe has two spindles, on one of which diameters up to 48 inches may be turned, while the other set of centers have a swing of 26 inches. The bed is 16 feet long and will take a length of 11 feet between centers. The lathe was furnished by J. J. McCabe, New York, and was built by the American & British Mfg. Company. Power is obtained from a 13 horse-power semi-inclosed Crocker-Wheeler motor running at 1100 revolutions per minute normally. It drives through an intermediate gear to a gear on the largest step of the cone pulley, the remainder of the drive being the regular connection. The mounting of the motor is peculiar, as the rear of the motor pad is supported by the spindle by resting on babbitted bearings. The speed of the spindle is comparatively low, so that there is no objection to this arrangement. It was resorted to because it made possible a more compact and simple mounting. Through the various back gear combinations within the lathe three speed changes may be made which multiply the 12 changes possible through the motor. The controller is placed on the floor near the tail end of the lathe and is manipulated through a splined shaft by a controller handle fastened on the carriage apron, so that the operator may control the motor without moving from his position.

Fig. 1.—A Two-Spindle, 48 and 26 Inch Lathe, 16 Feet Long, Driven by a 13 Horse-Power Motor.

Fig. 2 shows a 24-inch planer drive shaper made by the Hendey Machine Company, Torrington, Conn. It is used for light work on steel dies, for cutting off stock,

&c., and is driven by a 1 horse-power type L Crocker-Wheeler motor running at 1200 revolutions per minute at full speed and supplied with current on a two-wire system. The motor is mounted on a bracket bolted to the frame and connects by chain with a sprocket wheel tained by manipulating a rheostat, mounted behind the motor, as seen in the illustration.

A neat drill press drive is shown in Fig. 3. This machine is a 22-inch drill made by the W. F. & John Barnes Company, Rockford, Ill., and is driven by a 1 horse-power

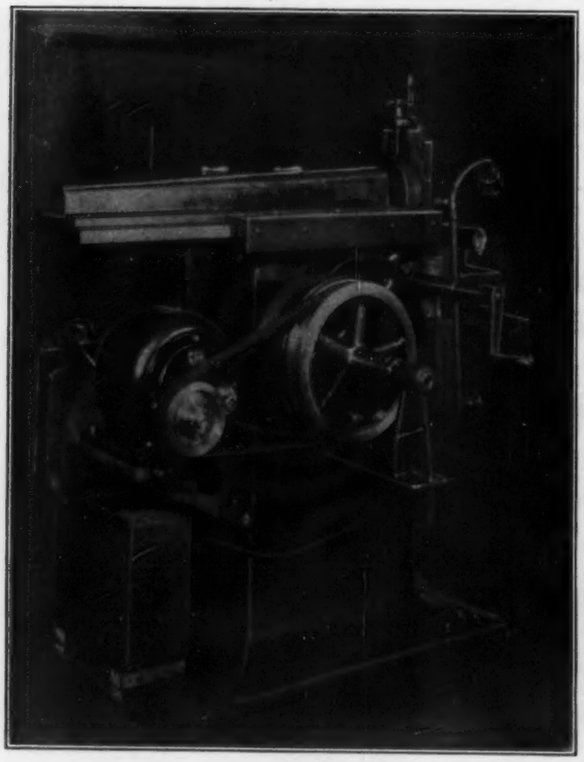


Fig. 2.—A 24-Inch Hendey Shaper Driven by a 1 Horse-Power Motor.

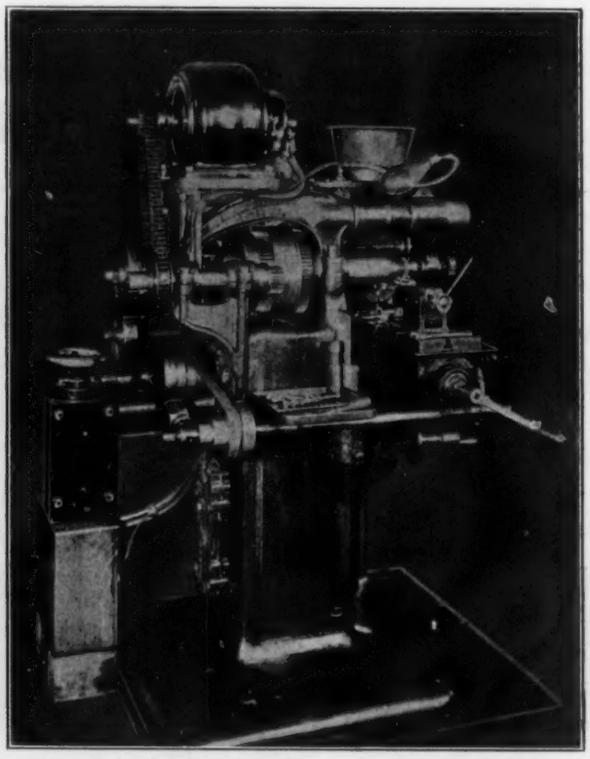


Fig. 5.—A No. 3 Becker-Brainard Universal Milling Machine, 1 Horse-Power Motor.

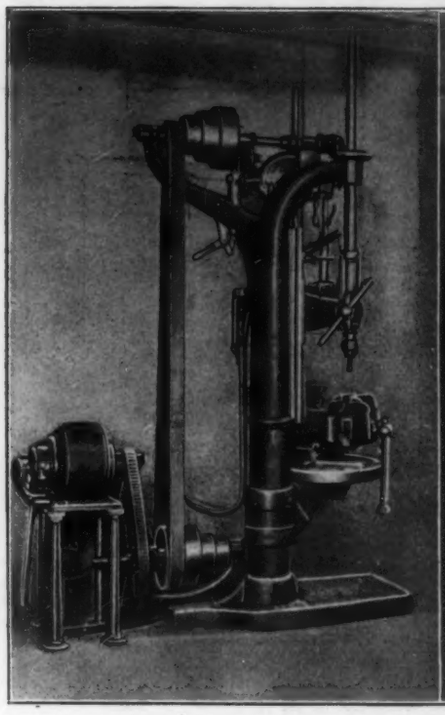


Fig. 3.—A 22-Inch Barnes Drill with a 1 Horse-Power Motor.

Fig. 4.—A 24-Inch Stockbridge Shaper with a 4 Horse-Power Motor.

which operates the forward or cutting stroke. The pulley for the return stroke is driven by belt in the opposite direction from a pulley on a small shaft, which is geared to the motor. This small countershaft is carried in a bracket bolted to the motor bracket. Beneath the motor is a small box containing the fuses and main line switches for the current supply. Eight speeds are ob-

motor through a chain connection. The motor is mounted on a base plate supported from the floor on pipe stanchions. The chain sprocket to which the motor connects is mounted on an extension of the cone pulley shaft and replaces the tight and loose pulleys which are furnished with the belt driven machine.

Fig. 4 shows a 24-inch crank shaper made by the

Stockbridge Machine Company, Worcester, Mass. While this machine is of the same stroke as the one shown in Fig. 2, it is designed for much heavier work, as may be seen from its heavier construction. The cone pulley regularly furnished with the shaper is replaced by a chain cable containing the leads to the motor. With this equipment the shaper has six speeds, obtained electrically, and through a mechanical speed box on the main driving shaft this range may be doubled. The highest possible cutting speed is 35 feet per minute, but this

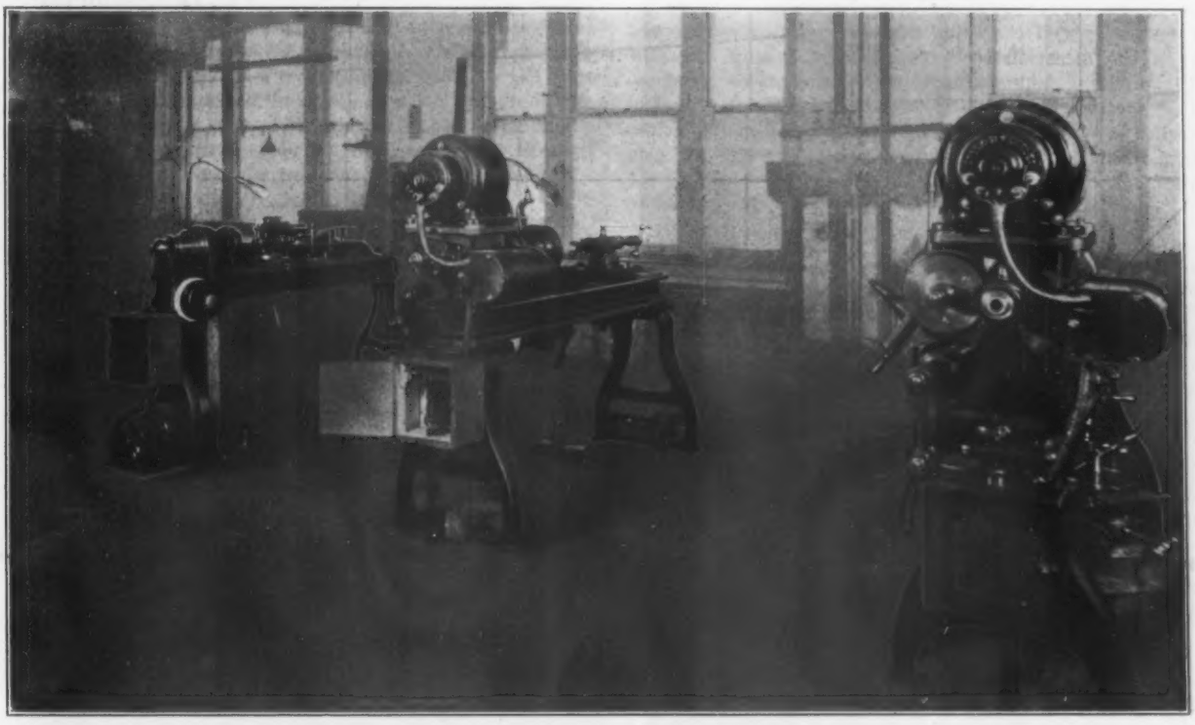


Fig. 6.—Three Motor Driven Lathes Used for Brass Work.

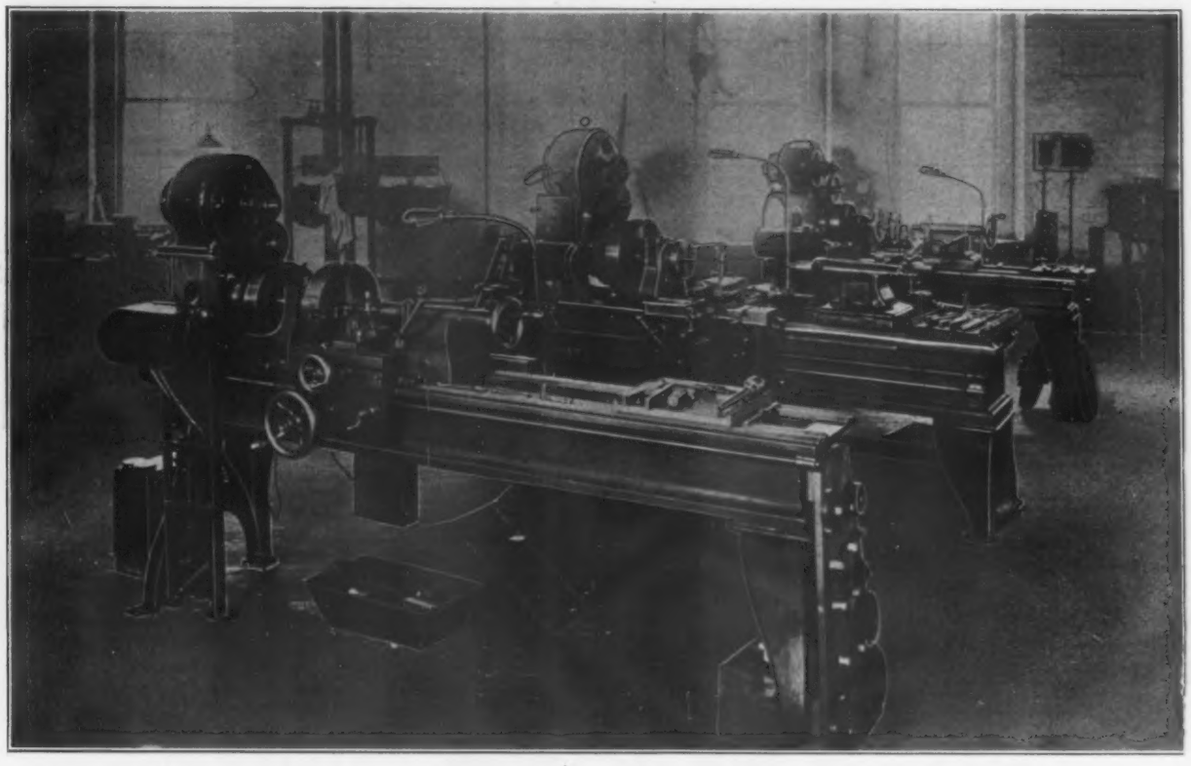


Fig. 7.—Three Larger Lathes for Iron Work. The Intermediate Gears Are Rawhide in Each Case.

sprocket, which connects through a Renold silent chain with a pinion on the motor. The motor is placed on the floor and is a 4 horse-power Crocker-Wheeler semi-inclosed motor running at 1170 revolutions per minute at full voltage. Connections for the wiring may be seen on the side of the machine, the upper cable containing the wires leading from the line switch box to the disk controller near the front of the machine, and the lower is faster than is ever used. The ordinary range is from 15 to 25 feet a minute.

At the right, in the background of the same engraving, is shown a No. 3 universal milling machine made by the Becker-Brainard Milling Machine Company, Boston, Mass. A better view of the tool is shown in Fig. 5. It is driven by a 1 horse-power motor running at 1200 revolutions per minute. It is supported on a bracket

mounted on the top of the machine. Another bracket supports an intermediate shaft, to which the motor connects by a Renold silent chain. At the opposite end of this shaft from the chain sprocket is a pinion engaging gear teeth on the middle step of the cone pulley, which runs loose on the machine spindle. Beyond this point the driving mechanism is unchanged from its original arrangement, there being back gears between the cone pulley and the spindle, used when a slower speed than the direct drive is called for. In this way the 12 speeds possible through the motor are doubled, so that the tool is capable of 24 different speeds. The controller is of the drum type and is mounted on the switch box, while the latter is supported on blocks directly upon the floor.

Three small lathes for brass work are illustrated in Fig. 6. These, from right to left, are a turret lathe, made by the American Tool & Machine Company; a 16-inch Fox lathe, and a speed lathe. In the first two cases the motor drives directly through gears, and in the last case it is connected by belt, being mounted on the floor between the legs at the head end of the machine.

In each of the first two the motor carries a pinion meshing with an intermediate rawhide gear, which, in turn, engages a gear on the next to the largest step of the cone pulleys. The first two motors are of 2 horse-power size and run at 1050 revolutions per minute at full speed. The boxes containing the line switches are mounted below the bed at the head end of the machine. The current mains are under the floor, and are brought up to these boxes through iron conduits. One of the boxes is shown with the cover open exposing the four-blade fused line switch. Drum type controllers giving 12 speeds, which are doubled mechanically, are used with the 2 horse-power motors and a controller of disk type giving six speeds direct and one reverse on the small lathe driven by the 1 horse-power motor.

Fig. 7 shows three lathes of slightly heavier construction, used for the turning of iron. The first is a Pratt & Whitney 16-inch lathe 8 feet long, which is driven by a 2 horse-power motor carrying a pinion which drives through an intermediate rawhide gear to a gear on the third step of the cone pulley, after an arrangement practically identical to the first two brass lathes which were described. This illustration shows the gearing better than Fig. 5. The next lathe has a swing of 20 inches and was built by the R. K. LeBlond Machine Tool Company, Cincinnati, Ohio. It is driven by a 4 horse-power semi-inclosed motor geared in the same manner as before described, and the third machine, the one in the extreme rear, is a lathe built by the E. P. Bullard Lathe Company. It has a 20-inch swing and is driven by a 2 horse-power type L motor. All three of these lathes have drum type controllers through which 12 speeds are obtainable electrically, this range being doubled mechanically by the back gears on the lathes. Other lathes in this section but not shown in the engraving include a Putnam lathe with 24-inch swing and 12-foot bed and a Gleason lathe with 30-inch swing. Both are driven by 4 horse-power motors.

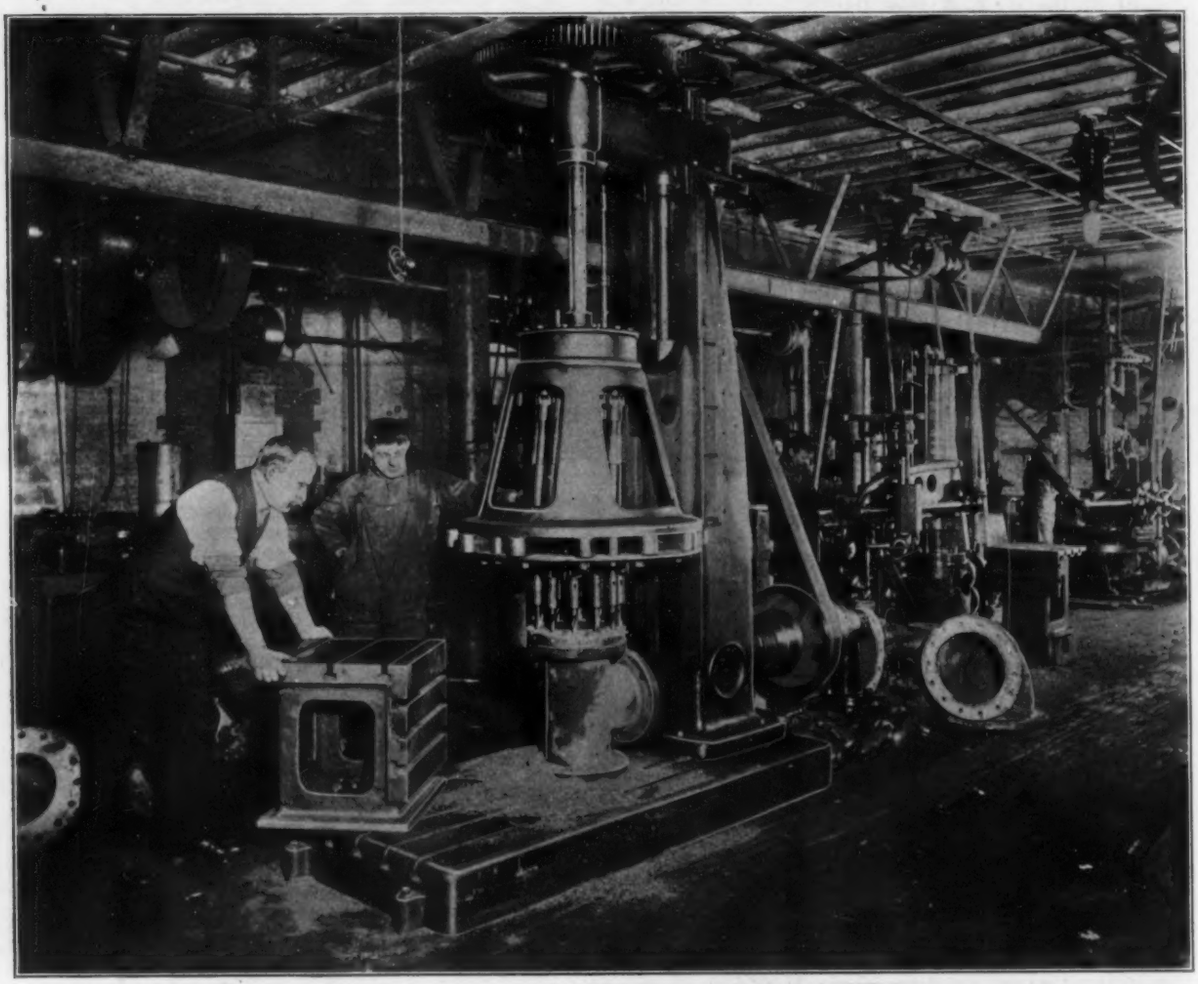


Fig. 8.—A View in the Old Part of the Shop, Showing the Shaft Drive, Which Is Now Being Replaced, and a Multiple Spindle Baush Drill for Boring Holes in Large Flanged Fittings.

In Fig. 8 is shown a general view of the old part of the shop, where the machinery is all driven from line shafting. This forms a striking contrast to the equipments shown in the other illustrations. Fig. 8 also shows a new tool recently installed for simultaneously drilling the bolt holes in the flanges of large pipe fittings. It was built by the Baush Machine Tool Company, Springfield, Mass., and has 12 spindles. These, being driven by universal jointed shafts, are capable of various adjustments between centers. By using only as many as may be needed

any number of holes from 1 to 12 may be drilled at a time. The holes may be drilled in a circle as small as 7½ inches in diameter or as large as 24 inches. The rated capacity of the tool is 12 1⅛-inch holes, but it has drilled nine 1½-inch holes at one operation. It is capable of using Novo or other high speed steel drills, and will go through 1 inch of metal in one minute.

The same engraving and also Fig. 1 are interesting in showing the overhead trolley system used for transferring work about the shop. It carries trolley hoists of a capacity of 2000 pounds, made by D. Round & Son, Cleveland, Ohio. The other tools in this section include a Wright lathe, three tapping machines made by Saunders & Son, Yonkers, N. Y., with maximum capacities of 3, 4 and 6 inches, respectively; a forge, anvil and grindstone, a Prentiss sensitive drill, a Blaisdell drill press, an emery wheel, a 26-inch drill made by the W. F. & John Barnes Company and a 5-foot Bickford radial drill. These tools are now being changed over to motor drive. One 7½ horse-power motor will drive in a group the three tapping machines. All of the other tools will be individually driven. The Baush multiple spindle drill will have a 20 horse-power motor placed on the floor behind the column and connected by a 4-inch chain with the cone pulley shaft.

An interesting characteristic of all of the motor drives which have been installed, and which will be adhered to in all that will be added, is that the original state of tool is not destroyed, and it may at any time be easily reconverted to belt driven form. The cone pulleys, as will have been noticed, were in most cases retained, and the gears which were placed on the steps of the pulleys are in the form of rings slipped on and secured by set screws. In the motor mountings the same care was taken not to destroy any part nor make it impossible to restore the belt arrangements. These equipments represent the joint work of George T. Hanchett, consulting electrical engineer, New York City, and George N. Noble, superintendent of the machine shop and power plant of the John Simmons Company.

The Buffalo Foundrymen's Association.—The regular monthly meeting of the Buffalo Foundrymen's Association was held in its headquarters, 23 Builders' Exchange, May 16. President Lyman P. Hubbell presided and 28 members and several visitors attended. After the regular order of business was disposed of the chair introduced Daniel Upton, supervisor of manual training in the Buffalo public schools, who in a very interesting talk explained the advantages of manual training offered at the Mechanic Arts High School to the young men of the city. This school has an excellently equipped pattern shop, 18 wood turning lathes, a cabinet shop with 24 work benches, a shop equipped with 20 forges and several drafting rooms. One of the basement rooms has been fitted out as a molding room, where the boys take lessons in molding before they enter the pattern making classes. The machinery is driven by electric motors. The branches of industrial training are as follows: First year, cabinet work and wood turning; second year, molding and pattern making; third year, iron forging, brazing, tempering, &c.; fourth year, machine shop practice. In each year the drafting conforms to the other work, the course as laid out consisting of free hand and mechanical branches. The latter takes in machine and allied subjects in the last two years. The aim is not to produce specialists in any line, but to develop the whole man by educating the hand and mind to work together. The boy is therefore better fitted to enter a larger field of usefulness. At present about 150 boys are taking the technical course, though it has been established only about two years.

Canada has paid in bounties on iron and steel production up to April 30 in the current fiscal year, a period of ten months, the sum of $941,007; on lead, $407,165; on crude petroleum, $243,148, and on binder twine, $9167. In the corresponding period of the next previous fiscal year the amount paid out on account of iron and steel was $679,322.

A Life Insurance Question in Bankruptcy.

WASHINGTON, D. C., May 23, 1905.—The United States Supreme Court has finally determined a question that has been at issue since the Federal Bankruptcy law was placed on the statute books in 1898—namely, whether life insurance policies having a cash surrender value must be transferred to the trustee by a bankrupt before he can be discharged, or may be retained as an exemption. The court holds in effect that the issue is one depending solely upon the exemption laws of the State in which the petition is filed, such laws being specifically recognized as controlling by the terms of the bankruptcy act.

The case in question, that of Holden & Holden *vs.* Stratton, arose in the United States District Court of Washington. The petitioners went into bankruptcy owning certain life insurance policies having a cash surrender value, whereupon the trustee, Stratton, sued to obtain possession thereof on the ground that, although such policies were exempt under the laws of the State of Washington, they were rendered nonexempt by the specific terms of section 70a of the Federal Bankruptcy law. The referee sustained the claim of the trustee, but his ruling was reversed by the District Court, whereupon on a petition for revision the Circuit Court of Appeals held that the bankrupts were obliged to pay the cash surrender value in order to retain the policies. The case came before the United States Supreme Court on a petition for a writ of certiorari.

The sole question before the Supreme Court was as to the controlling force of two provisions of the Federal Bankruptcy law, which at first glance appear to be conflicting, but which the court holds to be entirely consistent with each other. Section 6 of the act provides that nothing in the statutes shall affect "the allowance to bankrupts of the exemptions which are prescribed by State laws," &c. Section 70a, however, contains the following proviso:

> That when any bankrupt shall have any insurance policy which has a cash surrender value payable to himself, his estate or personal representatives, he may, within 30 days after the cash surrender value has been ascertained and stated to the trustee by the company issuing the same, pay or secure to the trustee the sum so ascertained and stated and continue to hold, own and carry such policy free from the claim of the creditors participating in the distribution of his estate under the bankruptcy proceedings; otherwise the policy shall pass to the trustee as assets.

Conflicting views as to the operation upon section 6 of the proviso in section 70a have been taken by the Circuit Courts of Appeal in various jurisdictions. The Supreme Court settles the controversy in a brief but comprehensive decision, in part as follows:

> As section 70a deals only with property which, not being exempt, passes to the trustee, the mission of the proviso was, in the interest of the perpetuation of policies passed to the trustee because they were not exempt, if they had a surrender value their future operation could be preserved by vesting the bankrupt with the privilege of paying such surrender value, whereby the policy would be withdrawn out of the category of an asset of the estate. That is to say, the purpose of the proviso was to confer a benefit upon the insured bankrupt by limiting the character of the interest in a nonexempt life insurance policy which should pass to the trustee, and not to cause such a policy when exempt to become an asset of the estate. When the purpose of the proviso is thus ascertained it becomes apparent that to maintain the construction which the argument seeks to affix to the proviso would cause it to produce a result diametrically opposed to its spirit and to the purpose it was intended to subserve.
>
> And the meaning which we deduce from the text and context of the proviso is greatly fortified by obvious considerations of public policy. It has always been the policy of Congress, both in general legislation and in bankrupt acts, to recognize and give effect to the State exemption acts. The judgment of the Circuit Court of Appeals is reversed, and that of the District Court affirmed.

There has been some controversy in the lower Federal courts as to the exact meaning of the words "cash surrender value" as employed in section 70a, some courts holding that it means a surrender value expressly stipulated in the policy and others that it relates to the sum which the insurance company might be willing to pay to cancel a policy whether containing such stipulation or not. The Supreme Court holds that this question is not involved in the case at issue and, although favoring the latter construction, declines to expressly decide the question.

W. L. C.

Ore Handling Plant at Conneaut, Ohio.

An interesting evolution in systems for the handling of ore has been worked out at the plant of the Pittsburgh & Conneaut Dock Company, Conneaut, Ohio. At this place the ore carrying trade of the Great Lakes makes connection with the Pittsburgh, Bessemer & Lake Erie Railroad, to transfer ore to the region of Pittsburgh and western Pennsylvania, where the ore is mainly consumed. The vessels are loaded in Duluth, Minn., and make the trip to Conneaut Harbor in about seven days. When the conditions allow it the vessels are unloaded directly into the cars, but if there are not sufficient empty cars to permit of uninterrupted unloading of the vessels their contents are temporarily stored on the docks in pits paralleling the vessels, or in a large storage area. The pits are used when the ore is only to be stored temporarily and the large storage yard when a longer retention of the stock is probable.

Ore handling is not the sole business carried on at Conneaut; there is also some transferring of rails and coal, but the transferring of ore is the most important work engaged in, and that to which the present article is to be confined. Such handling of coal as is carried on is mostly for the coaling of the vessels used in the ore transportation. The arrangement, as will be later explained, is such that no extra time is consumed in coaling, this being carried on simultaneously with the unloading of ore.

The docks, four in number, are located at the outlet of Conneaut River into Lake Erie, about 1½ miles from the Pennsylvania State line. The amount of ore handled here last year was over 4,000,000 long tons, in spite of the fact that the season was shortened by a strike of the lake captains and pilots, and it is probable that this record will be exceeded during the present season. The railroad is a single track road, having a capacity of about 650 40-ton cars per day. During one day last year, however, 756 cars were loaded and dispatched. The greatest difficulty at the present time is in the inability of the railroad to handle the material fast enough. Its capacity is practically reached, but the unloading machinery at the docks is by no means up to its limit. Better unloading facilities are also needed at the furnaces to allow the cars to make a round trip in shorter time. On the docks the cars are handled by switching engines, cable haulage and by gravity. In the cable haulage systems, endless 1-inch steel cables are used, which are driven continuously. At the ends of the haul the cables pass over large sheaves, one being fixed and the other movable, to take up slack. The drums on the driving engine around which the cable passes are arranged with friction rings, one for each lap of the cable, which will slip in case an excessive load is placed on the cable and prevent damage to the machinery or breaking the cable. The cable travels at about 1 foot a second and is used to move the cars by clamping to it at any point a short extension rope leading from the car or cars to be moved. Several cars may be moved at a time and stopped at any desired point, one man being sufficient to do the moving.

Dock 1.

Two of the four docks referred to have storage area, while the other two have not. Dock 1 has a capacity for storing about 546,000 long tons, is about 2000 feet long, and is equipped with 23 unloading bridges, a cable haulage system and several steam shovels and other machines for loading cars from the stock pile. These unloading bridges are of the McMiller type, are built principally of iron and steel, and are operated by steam. Each bridge covers a span of about 180 feet, and has an extension at the water side which may be raised to clear the masts of the vessels while they are docking. At the opposite end there is a cantilever about 75 feet long. The bridges are traveled by driving the two trucks on the shear and pier legs simultaneously, although either may be moved to a limited extent independently of the other, allowing the bridge to be skewed slightly to facilitate locating the bridge over the hatchway of the vessel. The capacity of the bridge is about 6000 pounds, moving load, about one-half of which is the ordinary lifting capacity. All of the movements of the trolley are controlled from the operator's house on the pier. The buckets are of a self dumping form, and are filled by shovelers in the hold of the vessel. Three or four buckets are handled in each hatch by one bridge, so that while one loaded bucket is lifted out the others can be filled and the shoveling continued unhindered. If the boat is a 12-hatch boat 12

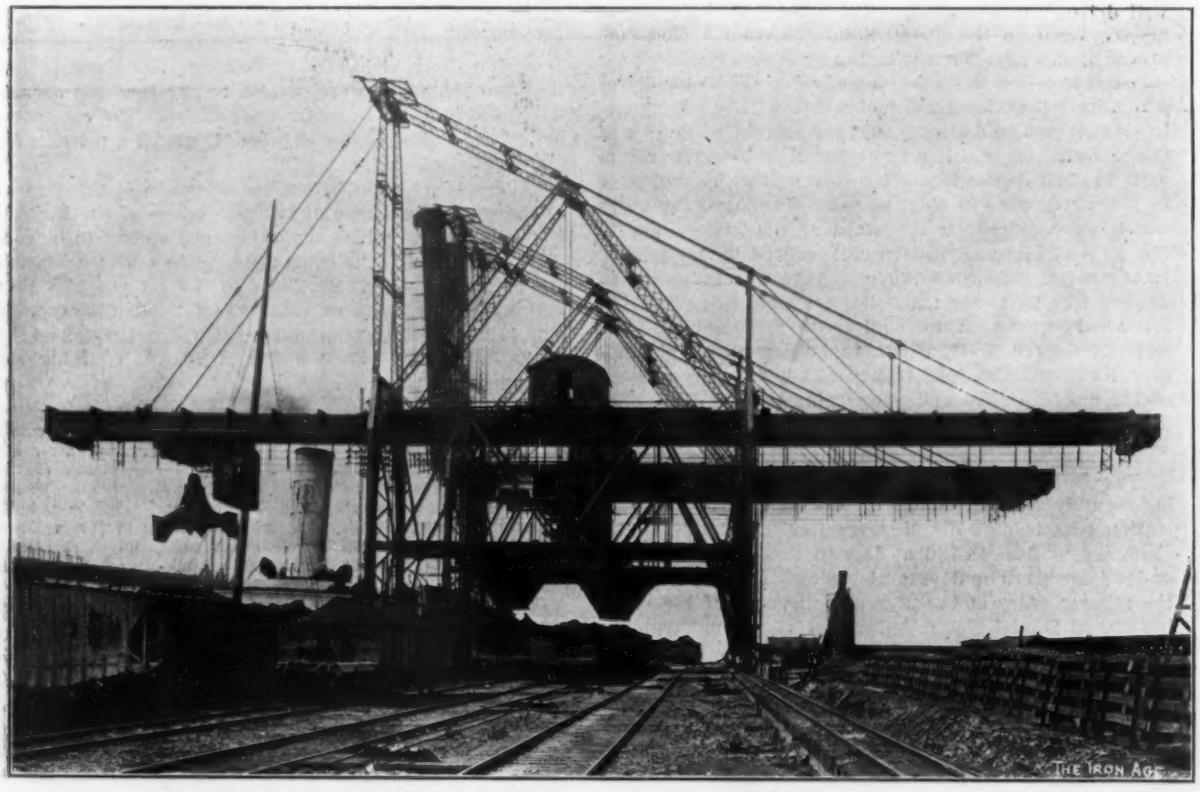


Fig. 1.—The Four Brown Electric "Fast Plants" for Unloading Ore at the Conneaut Docks.

of these machines may be working at a time. For the operation of these machines nine men are required for each hatch. With the machines on this dock the cost of unloading is about 15 cents a ton, most of this expense being that for labor. This figure is mentioned as being interesting to compare with the cost of unloading at the other docks, given later. The equipment on Dock 1 is, of course, the oldest, and the reduced expense at the other docks is largely due to improved machinery, but also to better organization in the handling of the machinery and the men.

Dock 2.

There is no storage area on Dock 2, the machines being arranged to unload directly from the boats into the cars. There are 12 unloading machines, these also being made by the McMiler Mfg. Company, Cleveland, Ohio. Cars are positioned under the bridges by a cable hauling system, and when loaded are hauled out over the same track upon which they came in. The machines are operated in groups of three, power being supplied by steam from one engine house for each group. Each machine in the group is independently adjustable in its relation to the others so as to allow for different distances between centers of hatches. These machines were originally provided with buckets of the same type as those used on Dock 1, but more recently these have been replaced by automatic grab buckets. This has resulted in the saving of considerable hand labor, but the speed of unloading has not been greatly increased, the capacity being between 50 and 60 tons an hour. The total cost of unloading a boat on this dock is about 6 cents a ton.

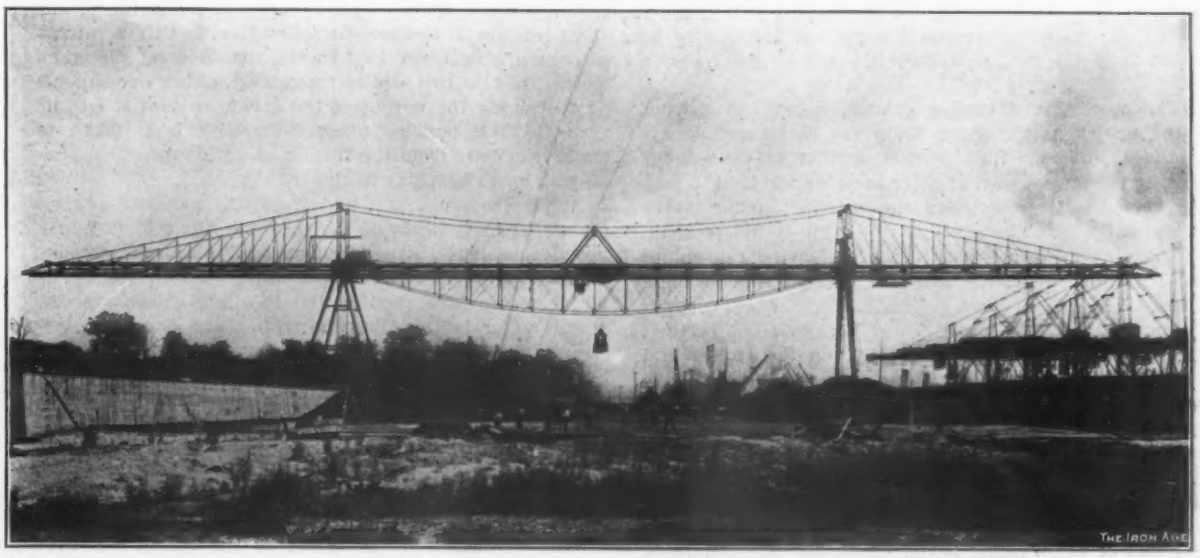


Fig. 2.—The Brown Electric Bridge Conveyor for Handling Ore from the Unloaders to the Storage Yard.

Dock 3.

The principal use of Dock 3 is the dumping of coal laden cars and the loading of coal on the vessels. It also contains the power house which furnishes electric light and power for the entire plant and steam for operating the car dumper. The latter is a machine similar to the type used at the furnaces for dumping ore from cars and is used to load directly into the ore boats for their return trip, or into a loading scow, which is taken to boats at other docks so that they may be loaded with coal while discharging their cargo of ore. The coal cars are run on a down grade track to a switchback and pulled automatically to their position for dumping in the cradle by a cable, to which is attached a small car known as a ground hog. This is ordinarily in a hole under the main track of the switchback. When the car is in position the cable is started, causing the ground hog to engage the coal car and draw it up to the cradle. The car is then clamped to the cradle and the ground hog descends by gravity to its hole between the tracks. The cradle with the car upon it is dumped by raising one side and the coal falls into a pan. While the car is returning to its upright position the pan is raised and the coal is discharged through a gate in the bottom into an apron, the latter end of which connects with a telescopic leg extending down into the hold of the boat. The cars, after being emptied, are allowed to run down an inclined track ready to be hauled away. The capacity of the dumping machine depends upon the size of the cars and the boats. It has dumped as many as 33 cars in an hour or about 200 in a day.

The fuel scow, which is used for loading boats at other docks, takes coal from the car dumper in the manner described and carries it in buckets or bins provided with gates at the bottom, through which it is discharged into buckets. A whirler on the scow hoists the loaded bucket and swings it over the hatch of the ore boat; the bucket is discharged by opening its hinged bottom. The whirler, as it is known, resembles a boom hoist, being designed to rotate about its vertical axis. It has a boom about 60 feet long and a lifting capacity of about 4 tons. Other whirlers are used on this dock for special operations of loading or unloading. These whirlers, equipped with grapple buckets, are capable of loading from 20 to 30 cars a day from the stock pile. They are very satisfactory for this work, but do not work well in a boat. Equipped with an ordinary bucket to load by hand, whirlers are still used for unloading hard, lumpy ore, but fortunately this includes only a small part of that which is received at Conneaut, as this method of unloading is expensive.

Dock 4.

Dock 4 is equipped with the most modern machinery and does from 60 to 75 per cent. of all the work done at this point. Notable records have been made here in ore handling, among which will be remembered the unloading of the steamer Augustus B. Wolvin, of which mention was made at the time. It consisted of the unloading of the entire cargo, 9945 long tons, in 4½ hours, using all of the machines on the dock and 50 men in the hold of the boat with shovels to assist the buckets. It was a record for speed but not for economy. The cheapest unloading which has been done was performed by the electrical machines described later, removing from the same vessel 9306 long tons in 15½ hours, at an expense of but little over $100. This is but little more than 1 cent a ton and represents a remarkable saving over the work performed at any of the other docks. The labor item alone was only $11.25.

The Hydraulic Unloaders.

There are two kinds of machines on this dock, four being hydraulic in their operation and four electric. The hydraulic machines are of the Hulett pattern, made by

the Wellman-Seaver-Morgan Company, Cleveland, Ohio, and are similar to those installed in the Lackawanna Steel Company's works at Buffalo and referred to in the description of that plant given in *The Iron Age* January 7, 1904. The buckets, in their open position, measure 22 feet from tip to tip, and remove at each filling from 8 to 14 tons of ore. In a single season these four machines have unloaded as much as 2,000,000 tons. Each of the machines weighs about 450 tons and is supported upon 22 truck wheels, running upon four rails, two at each side. The trucks are power driven, so that the machines may be individually adjusted to the hatches of a boat after it has docked. The main parts of these machines are a walking beam mounted on a trolley frame and a vertical bucket leg carried at its outer end. The operator stands in the lower end of the leg and controls all of the movements of the machines. The bucket descends into the hold by dipping the corresponding end of the walking beam, being opened while it descends; is then automatically filled and is raised by the walking beam, while the latter travels back on its trolley, bringing the bucket in position to dump its load through a hopper into a bucket car. The bucket or transfer car travels at right angles to the boat, under the frame of the machine, and may be placed over any one of the car tracks beneath, so that the load may be discharged into cars on any of the tracks. Cars on the nearest track may be loaded from the bucket without the use of the transfer car.

The opening and closing of the bucket and moving of the trolley and walking beam are performed by hydraulic cylinders. Still another cylinder is used for rotating the bucket so that after entering the hold it may be revolved to the most advantageous position for taking up its next load. The machines are entirely independent, each having its own steam plant for driving the pumps and obtaining hydraulic pressure through the accumulators. The steam is furnished at about 175 pounds pressure by a boiler in the lower part of the structure. The steam pumps are located above on the trolley and the pipes connecting the pumps with the boilers have swivel joints to accommodate the movements of the trolley. The water at city pressure is delivered through a smaller swivel jointed pipe to a tank on the trolley, from which the steam pumps take their supply. The overflow from this tank forms the boiler feed. The steam pumps deliver the water into an accumulator on the rear end of the walking beam, which has two chambers, one for water and one for steam, separated by a double headed piston so proportioned that the boiler pressure on one side balances a pressure of about 1000 pounds per square inch on the water side. The longitudinal travel of the entire machine is obtained from a small steam engine in the lower part of the structure near the boiler house; this engine also operates the transfer car.

The first part of the unloading is performed at the best speed, as the bucket can then take the largest loads and entirely without external assistance. During the first hour one of these machines has unloaded 680 tons, with an average bucket load of 11 tons. This means a round trip about once each minute. The last of the cargo cannot be removed so rapidly, as time is lost between loads in scraping up the ore so that it may be reached by the bucket. For this work eight shovelers are needed for each machine. Under favorable conditions an entire cargo may be removed at an average speed of 200 to 250 tons per hour per machine.

The Electric Unloaders.

The four electrical unloaders are the latest machines and were erected last year. It was the main aim in designing these machines to increase the economy by reducing the hand labor, as practically all has been obtained in the way of speed that could be hoped for. The electrical machines were built by the Brown Hoisting Machine Company, Cleveland, Ohio, and have been given the name of "fast plants"—each handles a 5-ton bucket and without hand labor in the hold of the boat removes an average of 150 tons an hour until 75 per cent. of the cargo has been discharged. Less is required in the way of attendance for these machines, the number of men employed being seven, including one foreman, four operators and two oilers, and, to clean up so that the last of the cargo may be removed, five men are required in the boat for each machine.

One machine complete weighs about 175 tons and is built to travel on the same tracks that carry the hydraulic machines. There are 16 truck wheels, all driven by a 75 horse-power motor in the motor house above the track and connected with the trucks by vertical shafts and gears. The machines may be moved along the dock at a speed of 70 feet a minute and may be stopped instantly by the application of a solenoid brake which operates when the power is shut off. Like the machines on Dock 1, these have an apron extension over the water, which is 59 feet 6 inches long and hinged so that it may be raised clear of the boats to allow them to dock or sail away. In its lowered position it is 47 feet 8 inches above the water. The same motor that drives the moving gear is used to raise and lower the apron, this being done by wire ropes leading from the outer end of the apron to sheaves at the top of the structure and down to drums in the motor house. The apron hoisting mechanism also has a solenoid brake which stops automatically when the power is cut off and will hold the apron in any position. There is also a safety lowering device on the apron hoisting drum shaft which by friction holds the drums from turning in the lowering direction, but by a ratchet always allows them to turn in the hoisting direction. There are also two sets of ropes used, either one capable of sustaining the weight of the apron, so that it will be seen that all possible precautions have been taken to avoid accidents from the falling of an apron.

The operator rides in the trolley, running on a track below the motor house, and from this position controls all of the movements of the machine. The loaded trolley may be traveled at 900 feet a minute and hoists its load at a rate of 300 feet per minute. Two 150 horsepower motors are used in the hoisting, one 100 horsepower motor in traveling the trolley and one 3½ horsepower motor in rotating the turntable carrying the bucket. The closing and hoisting of the bucket is done with the motors, and the lowering by brakes. The rotating of the buckets enables them to be placed at various angles so as to reach as much of the material as possible without hand labor. During the past season the electrical machines unloaded about 686,000 tons, working eleven hours a day.

The extension of the travel of the trolley out over the boat is 49 feet 5 inches from the center of the nearest track and the travel to the rear is 116 feet 5 inches from the same center, making the total trolley travel 165 feet 10 inches. The distance from end to end of the fast plant is 190 feet, and each machine is 23 feet 6 inches wide. The total hight above the water is 117 feet. Four loading tracks are covered by the machines, with room for a future fifth, the distance between the piers being 62 feet 10 inches. The pit previously referred to for the temporary storing of ore when cars are not at hand is under the outer ends of the rear cantilevers and has a capacity and shape about that of the cargo space of the largest ore vessels. This pit is also used when material is to be stored in the large yard. Being first dumped in these pits by the electric and hydraulic machines, the ore may be taken by a large electric bridge conveyer and dumped on any part of the stock piles.

The Storage Yard Bridge Conveyor.

This bridge covers an area about 600 feet long and 565 feet wide, the first being the length of its travel and the latter the length of bridge. The distance between supports is 250 feet, leaving the overhang at each end about 157 feet; the hight above the dock is 68 feet and the clearance under the bucket about 52 feet. Like the electrical unloaders the bridge was built and designed by the Brown Hoisting Machinery Company, under patents of Alexander E. Brown. One end of the bridge reaches the temporary receiving pit and takes the ore discharged there by the unloaders. The manipulation of the bridge is similar to that of the electrical unloaders, being controlled by an operator traveling in a cage on the trolley. The bridge is equipped with a grab bucket of about

7 tons capacity. The only difference between this bucket and those on the unloaders is that no provision is made for rotating it. The conveyor weighs 525 tons and is carried on 32 truck wheels, 24 of which are driven. It is capable of a traveling speed of 80 feet per minute. With a load the bridge trolley may be moved at the rate of 1000 feet per minute and will hoist a loaded bucket at 225 feet per minute. A 150 horse-power motor moves the structure along the runway, being connected with the trucks by gears and shafting. Solenoid brakes operate when the power is shut off to prevent the bridge from drifting. It is possible by operating clutches to travel only the pier end of the bridge so that the bridge may be skewed in the same manner as the bridges on Dock 1. In this way the pier can be moved about 25 feet either side of a central position without moving the shear. With a load the total moving weight of the bridge is about 43 tons. The trolley itself is carried on four wheels driven by two 75 horse-power motors through a gear on each axle, and two 150 horse-power motors are used in hoisting the bucket. A brake is used for dumping and lowering the bucket and one for holding the hoisted load, while a third brake stops the trolley. All of the movements of the hoist and trolley may be controlled from any position of the trolley on the bridge, but the traveling of the bridge can only be effected when the trolley is either at the pier or the shear, controllers being located at both of these points within reach of the operator from the window of his cage. The conveyer has a capacity of 250 tons per hour, carried from the pit to the center of its travel.

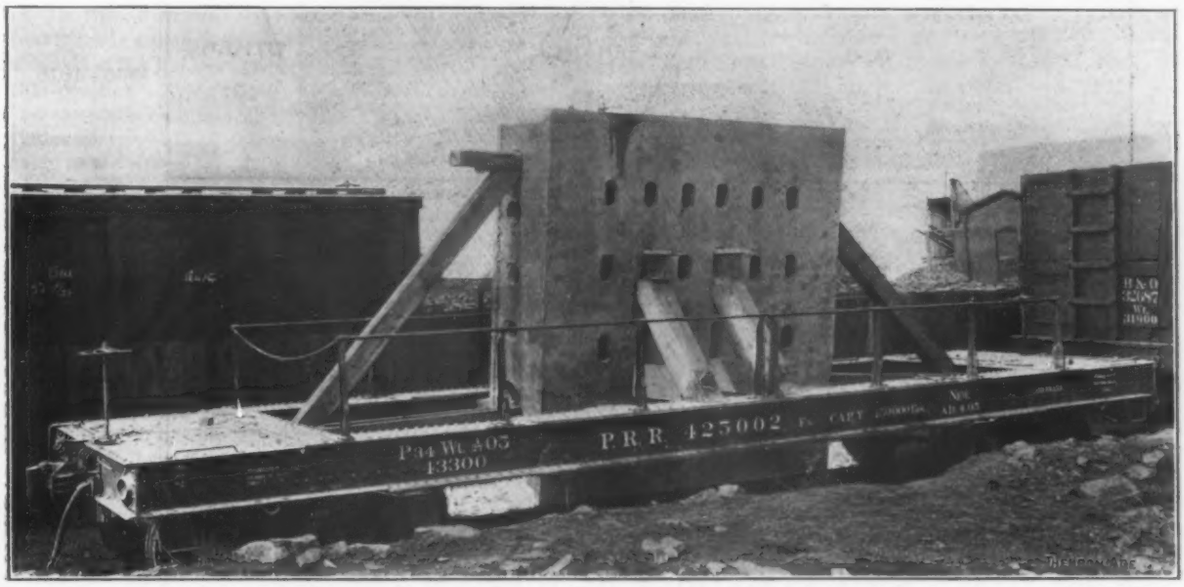
The principal use of the stock piles is to increase the elasticity of the plant. During the season of navigation the vessels can be unloaded faster than the cars can carry the ore away, and during the winter, when the vessels do not sail, the cars have a chance to catch up, emptying the storage piles conveniently before the next season's receipt of ore begins. The bridge over the storage pits handles the material from either the hydraulic or electric unloaders and it is also of use as an overhead crane when making repairs upon or dismantling the hydraulic machines.

A test made at Purdue University, Lafayette, Ind., of composite bricks made at Indianapolis, of sand, cement and lime, showed a crushing strength of more than 15,000 pounds, as against 1500 pounds for an average clay brick and 3500 pounds for an average faced brick. In transverse strength the composite brick showed a resistance of over 2500 pounds.

Steel Castings for Blackwell's Island Bridge.

The Thurlow Works of the American Steel Foundries, at Thurlow, Pa., has recently completed the largest and heaviest steel casting ever made in this country, or, in fact, in any country, to be used in building pier No. 1 of the Blackwell's Island Bridge, which will span the East River between New York and Brooklyn. The American Steel Foundries will make 32 of these steel castings to complete the order. When the order was received it was at once decided to have three special cars built of structural steel to transport these immense castings from Thurlow to New York City. These cars will be loaded to within 6 inches of the top of the track rails.

The accompanying illustration shows the first steel casting, weighing 90,760 pounds, placed on its side on board the car ready for shipment. This casting measures 12 feet 2 inches by 12 feet 2 inches at its base, 8 feet 5 inches by 10 feet 5 inches at the top and is 3 feet 9 inches high. The thickness of the metal throughout the casting is 2¾ inches. The center or body of the casting is formed of the frustum of a pyramid, with ribs connecting the top and bottom plates, and the inside of the casting is a net work of ribs. The top and bottom plates are plain and have oblong holes for the purpose of removing the cores from each individual cell of this net work; 60 holes have been drilled in the top and 32 holes drilled in the bottom plates for construction purposes. This steel casting is to be placed on top of two other steel castings, which have already been cast and bolted together, and another casting will be placed on top of the casting shown in the illustration.



A Large Steel Casting for Blackwell's Island Bridge.

To make a steel casting weighing 90,760 pounds involves an immense amount of labor in making the molds and in the setting of the cores, nearly every one of which is set at an angle two ways, and it is only by very skillful handling that good results can be obtained. The molds have also to be carefully secured in order to withstand the enormous pressure while the metal is being poured into them. The metal in this steel casting was poured from three ladles and was the product of three furnaces.

The manufacturing, shipment and placing in position of these 32 immense steel castings are each an enormous work in itself, and it is only by a proper understanding of details of this character that the general public can ever comprehend the ingenuity and work involved in a construction such as the Blackwell's Island Bridge.

Charles E. Pope, president of the Pope Tin Plate Company, Pittsburgh, has returned from a long trip abroad.

The World's Supply of Iron and Ores.*

BY R. A. HADFIELD, SHEFFIELD, ENGLAND.

Present and Future Requirements.

As the question of the present rate of consumption of iron and also its past and future production are of considerable importance, I have prepared a number of diagrams dealing with these points.

Diagram 1 shows the production of pig iron, advancing by periods of 25 years, since 1800. The total production since that year to the end of 1904 approximately has been 1,100,000,000 tons. We still occupy the first position as regards total or aggregate production, having produced more pig iron over the whole period than any other nation during the past century. The figures are: Great Britain, 400,000,000 tons; America, 250,000,000 tons, and Germany, 170,000,000 tons. This is shown in diagram 1.

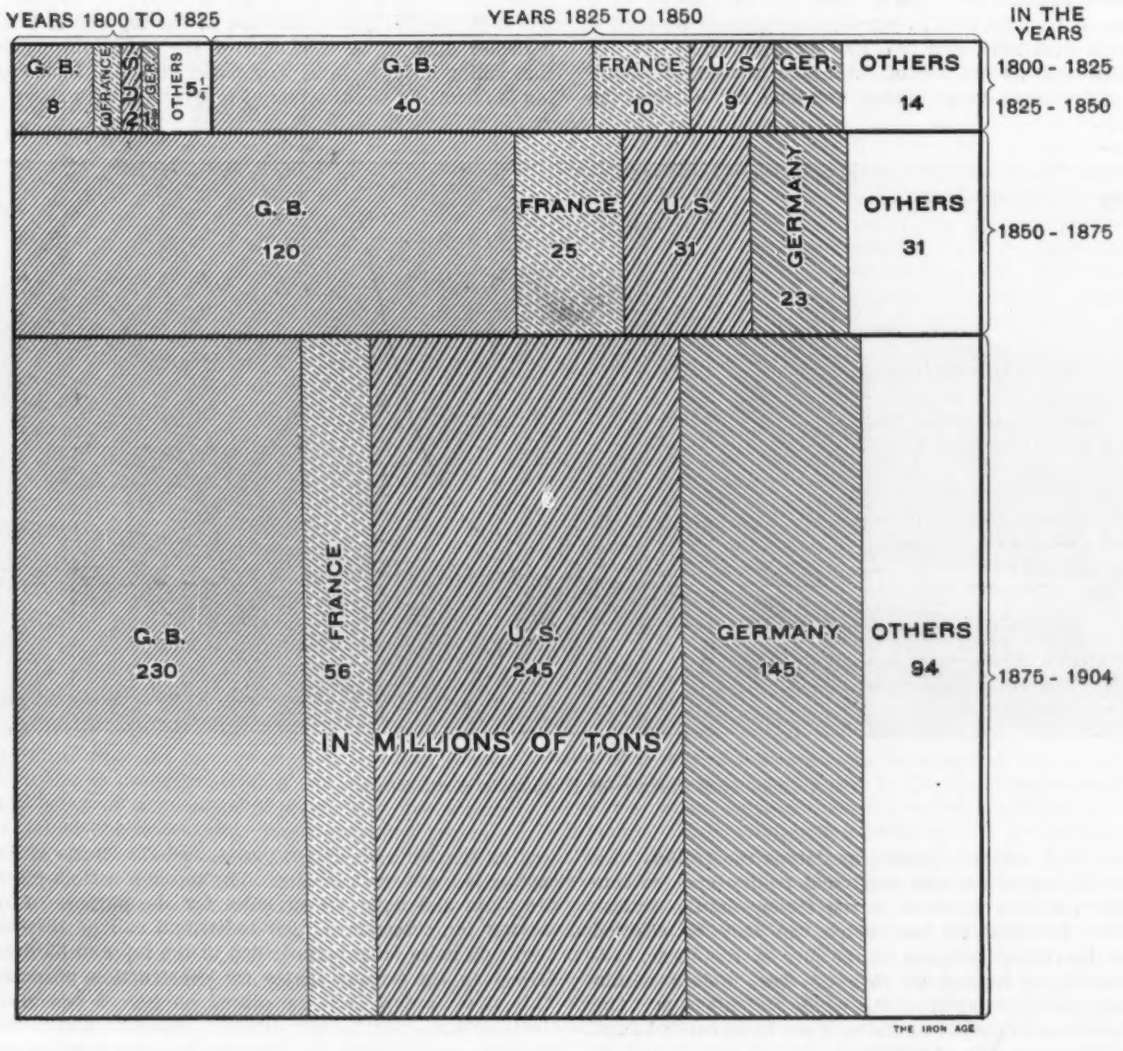


Diagram 1. The World's Production of Pig Iron from 1800, in Periods of 25 Years, Showing the Production of the Leading Countries.

Next comes the question of the future. The full lines in diagram 2 represent actual production from the year 1500 to 1904; the dotted lines show the estimated production in the years 1950 and 2000, based upon the supposition that the increase will continue in the same ratio as during the past 30 years.

Human minds are finite in their conception, and usually regard only their immediate environment; yet an independent forecast, not more improbable than that supplied by our meteorological office, may prove interesting.

Although it is impossible to see into the future, human affairs have "tendencies." The tendency now is largely to increase the use of iron, and unless some cataclysm arises this is bound to go on during the present century; therefore one may intelligently surmise the extent to which the use of iron will increase. Accepting the figures given it will be seen that this use will become greater and greater, and probably on a scale that we today little dream of.

When it is borne in mind, as shown by the curve in diagram 2, how rapidly production has risen, practically without a break of any kind since the year 1860, I see no reason to suppose that the probable increase shown by the dotted lines will not take place. If 50 years ago a prediction had been made that the present world's output would reach 50,000,000 tons per annum, as it has done, it would have been thought absurd; therefore this probable production of close upon 100,000,000 tons in the year 1950 may not be much outside of the mark. It must not be overlooked that fresh requirements for this metal are constantly being found; in fact, the increase in the use of iron is very much like the gathering of a snowball.

If only two-thirds the present known population of the world used as much iron per inhabitant as in America and the United Kingdom the production would require to be no less than the figure 250,000,000 tons per annum, even at the present day. As time goes on there must be an awakening to this demand for iron by the countless multitudes of human beings in the east, the inhabitants of our Indian Empire and the myriads of China.

* From his presidential address before the Iron and Steel Institute, Sheffield, May, 1905.

Increased Use of Iron

naturally follows growth of population and greater wealth, even in thoroughly civilized countries; the development of the metallurgical arts improves quality and reduces cost, so that with improved facilities a larger demand follows. New uses for iron spring up each year; to mention only a few that have arisen during the last 10 or 12 years proves this. At one time we see the construction of immense buildings, as in America, in which a very large quantity of steel is used; this use will surely extend on both sides of the Atlantic. There has been a great development in the construction of steel railroad cars, used in substitution for those of wood, and there are many similar applications of the metal in place of timber or other materials. Steel shipbuilding is sure to increase in magnitude; and new railroads are constantly being required. In other directions, as for automobiles, new demands are ever arising, and all these uses tend to increase the already enormous consumption of iron. As little rills make up a mighty river so these new demands will in gathering numbers continue to add to the use of this metal throughout the world.

Let us look at the matter in another way. Supposing the world's consumption of iron per head to be the same as that of each inhabitant of the United Kingdom and of the United States. At the present rate only enough iron is made annually to meet the wants of about 200,000,000 people, but the world's population is nearly eight times this number, so that 1,400,000,000 of the globe's population do not get an ounce. If, therefore, the demand continues to increase in the same ratio as in the past, and even if we allow for only 1,000,000,000 of people being supplied (disregarding one-third of the world's population) then 250,000,000 tons must be made annually. At the present rate of increase by the end of this century a supply of 145,000,000 tons should be reached, and probably even this will be far from enough for the then human needs.

Therefore by the time named—*i.e.*, the end of the present century—it is quite within the bounds of possibility that the large total mentioned in diagram 2 as to probable annual requirement is not so far from being correct as might at first sight appear.

Sources of Supply.

This at once raises the important question: Whence will come all the vast store of ore needed? The subject is well worthy of our consideration, as it is one that concerns us all very seriously.

Fortunately iron ore is plentiful, but will it stand for long the enormous drain upon it? Since 1800 about 3,300,000,000 tons have been used up; in the next 100 years no less than about 15,000,000,000 tons will be needed, even if no allowance be made for increase of consumption. Assuming that the rate of increase indicated by diagram 2 takes place, then about 30,000,000,000 tons of iron ore will have to be taken out of the ground during the present century.

Each ton of pig iron requires about 2½ tons of ore, or, allowing for waste of various kinds, a fair average is 3 tons of ore per ton of pig iron produced. Therefore in 1904 about 150,000,000 tons of ore were used; but if we base our estimate upon the lowest figure in the above statement (that is, allowing for the use of iron by a comparatively smaller number of the world's inhabitants) by the year 2000 450,000,000 tons of ore will be required annually. Such a consumption, if it continued for a century only, would need no less than 45,000,000,000 tons. Such a rate would quickly exhaust all the present known supplies of the world.

If we accept Sir Robert Ball's theory that the metal or its oxides have been largely formed from outside the globe, or if as metal, or its oxide, as the case might have been, it was ejected from the interior by volcanic action, then it must be concluded that we cannot expect to find more supplies of serious moment available below the earth's surface.

Although the minerals in which iron exists are numerous the metal can only be obtained economically from ores in which the metal is combined as an oxide, as in magnetites, hematites, limonites, or as a carbonate, as in siderites, where the iron is combined with oxygen, or oxygen and carbon. Iron pyrites, which occurs so abundantly, cannot be utilized by any yet known process. If the statement be true that iron came originally from outside the globe, then all deposits must more or less be on the surface. Sir Robert Ball states that it is shown by the researches of Biot that the origin of meteoric constituents has been transferred from the dominions of geology to those of astronomy. Ball further states that an appreciable part of the solid substance of the globe may have been derived from meteoric matter, which has descended in perennial showers upon its surface—not manna but "ferrum from the heavens!" Geikie, however, quotes Prof. S. Arrhenius as stating that on account of the preponderance of iron in nature, both in meteorites and in the sun, and also from the phenomena of terrestrial magnetism, it may be inferred that a very dense substance exists in the earth's interior, and that this is

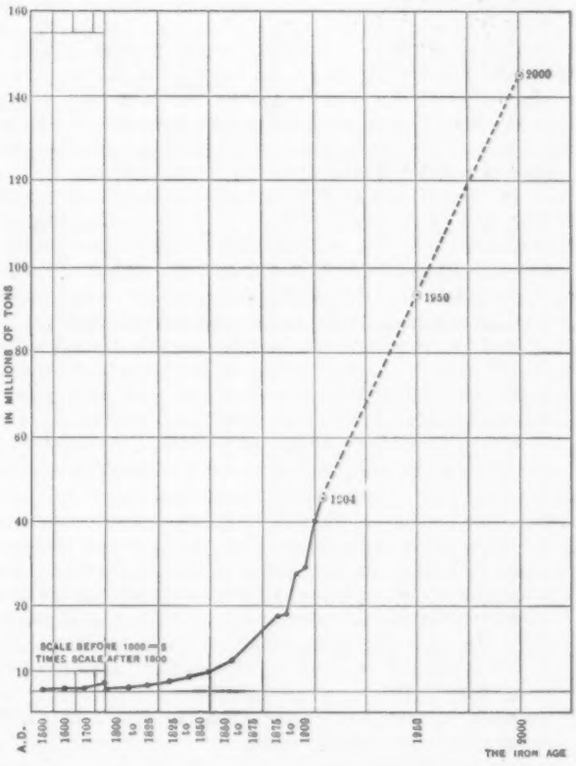


Diagram 2.—The World's Annual Production of Pig Iron from 1500 to 1904 and Its Estimated Annual Production to the Year 2000.

iron. He considers that half the planet should therefore consist of iron, the outer crust being composed of 4 to 5 per cent. of the metal. If this assumption be correct it is good news; for if iron is with us in such enormous quantities, then surely ways of which we do not now dream will be found to win this veritably precious metal. In any case, the whole question presents a most fascinating study, and one that must eventually concern the welfare of every inhabitant of the world.

As a comparison and showing the much greater supplies of the useful element, carbon, it may be interesting to add that the recent Coal Commission estimates the supplies of coal available within the United Kingdom are 146,874,000,000 tons.

Increasing Importance of Metallurgy.

If in a few centuries there is likely to be a lack of iron ore it greatly concerns us all to watch this question. The possibility also shows the importance of metallurgy and the necessity for encouragement of its scientific study, so that every reasonable economy in the use of this valuable metal may be fostered. It proves to that the man who can make one pound of iron go as far as two pounds do now is also a benefactor to mankind, and it follows that a knowledge of special steels, which are really economical steels, is of the highest importance.

As will be seen by diagram 2, before the year 1800 the total production of iron was insignificant, as compared with that of to-day. The curves and data are significant, and confirm what has already been said, that the rise in the use of iron has been the great cause of civilization.

The curve in diagram 2 is really astonishing. It points out that the increase in production during the years 1860 to 1904 was continuously progressive. There is no reason to think this curve will either remain at the same level or will dip down again. It must continue to rise, but whether at the rate pointed out it is impossible to say. My own belief is that it will. Many no doubt who read these remarks will say, "Does this concern us of to-day?" If a deficiency must take place in 300 or 400 years what will then be said of us?

An important blue book on "Iron Ore Deposits in Foreign Countries" has recently been prepared by Llewellyn Smith. Valuable information is given in the publication regarding the sources of supply of iron ore. Attention is called by the author to the Shansi district in China, which when properly opened out is expected to prove one of the most valuable coal and iron regions in the world. Thus we must look forward to the day when the metallurgical resources of China will be developed and will further add to the world's output.

Dr. Percy spoke of the enormous output of coal in 1862, and said that the time had come "when necessity should compel us to act differently both in our manufactories and households." Yet to-day the output of coal in the world is over 600,000,000 tons annually, and no one troubles whence supplies are to come in the future.

Had Dr. Percy known that the world's annual output of iron only 20 years after his death would be close upon 50,000,000 tons it is very probable he would have urged careful consideration of this important question.

Let us turn for a short time to the consideration of the views of various authorities on the question of

Supplies of Iron Ores.

Our past president, Andrew Carnegie, speaking of those in this country, has estimated that Cleveland ironstone would be practically exhausted in about 25 years. J. S. Jeans, however, says that in such estimate no credit is given for the use of inferior grades of ore, still largely available. He also stated that while the estimated output of Cleveland iron during the last 50 years has been about 220,000,000 tons, this source was not nearly exhausted—in fact, little more than the fringe of the inferior grades had been touched.

There are also the Cumberland supplies, and some hold there is perhaps a quantity of iron ore remaining in that district equal to that already mined.

Mr. Jeans points out that it is certain neither the United States nor Germany at the end of 25 years from now will have virgin sources to draw upon, so far as present knowledge enables a forecast to be made. He further adds that Germany claims to have at present larger unexhausted supplies of ascertained ores than there are in any other country; and that it is estimated the minette ore of Lorraine is probably sufficient to support the present rate of working for 800 years.

All such estimates are of course more or less conjectural. It is quite probable that in Lorraine, and in our own Cleveland district—where several years ago the mass of ore was computed to be 5,000,000,000 tons—the good ores will only be a relatively small proportion of the total estimated resources.

Mr. Carnegie in November, 1902, considered that if the amount of high grade material in sight in the United States were placed at 1,000,000,000 tons, then at the rate of consumption of 20,000,000 tons per year the supply would be exhausted in the first half of the twentieth century. He also stated that the exhaustion of the then discovered high grade ores within a few decades was little short of a certainty.

In the Mesaba district there is stated to be a proved supply of 500,000,000 tons, and on the four old ranges there are about 250,000,000 tons. On the other hand, D. E. Woodbridge in an article on "The Masaba and Baraboo Range," says that there is now a general consensus of opinion that the Mesaba is pretty well "found," that new discoveries will be few and far between, "and that new comers will be sadly disappointed if they look for large beds of ore to be discovered by any one who sticks a drill hole into the ground." He points out that on the Mesaba there are more than 20,000 drill holes, stretching in unbroken succession from T. 60, R. 12, to the Mississippi River. If much ore is left unfound it will be most astonishing to those who have seen the skilled operations and the exact knowledge of local geological conditions with which these holes have been put down. These conditions do not lead to the conclusion that other districts than those now known are in the forests and swamps of northern Minnesota.

The Lake Superior iron ore deposits have been worked since 1855, as follows: The Marquette, 49 years; Menominee, 27 years; Gogebic, 20 years; Vermillion, 20 years, and Mesaba, 12 years. From 1855 to 1903, inclusive, the total production of ore has been about 245,000,000 tons.

The proportions of the different grades of iron ore shipped from the mines in 1903 were:

	Per cent.
So-called magnetic ores, consisting partly of magnetite and partly of hematite	2
Hematite, hard specular ores, limonite and soft red hematite	98

It must also not be overlooked that the waste in producing and working up iron is very heavy. Most of the metal thus lost can never be recovered. As the greater part of pig iron is converted into steel, the total remaining in this process can fairly be judged when estimating losses. This waste is in addition to the actual loss of iron itself, because the elements carbon, silicon and manganese are counted in where the weight of the total production of pig iron is considered.

The lost account is made up approximately as follows, no loss being credited to iron wasted in the reduction of ore in the blast furnace:

Conversion of Pig Iron Into Steel.

	Per cent.
Average loss by the elements wasted; that is, carbon, silicon and other elements	7
Loss by direct oxidation	5
Further loss by oxidation during the working up by rolling, forging and so on	5
Probably there is a further loss by heat treatment for the various steels used by working up from the rough billets, and so on	5
Further waste by wear and tear, atmospheric oxidation	1

These figures show that at least 23 per cent. is wasted annually on a pig iron production of about 50,000,000 tons, so that over 10,000,000 tons can never be recovered. Thus, at the present rate of output, about 1,000,000,000 tons are wasted in a century, a quantity equivalent to a loss of about 3,000,000,000 tons of ore.

The Schoen Steel Wheel Company.—This company has decided to make very large additions to its car wheel plant, located at McKees Rocks, Pittsburgh, and when these additions are completed will have a capacity for turning out about 250 car wheels a day. The new equipment is to include a hydraulic press, to have a capacity of 7000 tons to the square inch. Two smaller presses of 1200 tons capacity each will be installed for coning and punching the blanks. Two heating furnaces are also being installed. The present rolling mill is of sufficient capacity to take care of the increased output. A steel building 80 x 390 feet is to be erected, and the contract will be awarded this week. The building will be served by a 10-ton crane, the crane runway extending the entire length of the building. One wheel recently tested showed a deflection of less than 1-100 inch after it received 60 blows, 36 on the rim and 24 on the hub, from an 1800-pound drop falling from a hight of 12 feet.

The American Foundrymen's Association, Dr. Richard Moldenke, secretary, Watchung, N. J., announces that convention headquarters for the meeting to be held June 6 to 8 will be located in the Murray Hill Hotel, Forty-first street and Park avenue, New York. From reports received so far an unusually large attendance is promised. The evenings of the convention will not be devoted to business sessions, so that the visitors may fully enjoy the amusements of America's metropolis. Very many papers are promised.

Reciprocity, an Economic Policy.*

BY EUGENE N. FOSS, TREASURER B. F. STURTEVANT COMPANY, BOSTON.

Broadly speaking, there have been in the past only two alternative commercial policies: On the one hand protection, on the other free trade. This is no longer true.

A third commercial policy is before us to-day and demands consideration. I am here for the sole purpose of defending reciprocity as a consistent and reasonable policy for the development of a nation and of persuading this representative body of American manufacturers that their largest and highest interests can be more perfectly safeguarded and developed by this policy than by any other; and that at the same time, by this means, the welfare of our people and the progress of civilization will be aided and advanced.

[The speaker then narrated our experience with reciprocity, taking up in turn the Canadian, Hawaiian and Cuban treaties and the trade agreements with France, Germany, Italy and Portugal, making deductions from all of them in favor of reciprocity. He reviewed the causes which led up to the failure of the Kasson treaties. Continuing, he said:]

The total value of manufactures exported has more than doubled in ten years. From forming 21 per cent. of our export, or $183,000,000, ten years ago, manufactures now form over 31 per cent., or $452,000,000, while in the same period the export of agricultural products has shrunk from 72 to less than 60 per cent. of the total, although increasing in actual volume from $628,000,000 to $853,000,000.

The world has bought of our agricultural products because it must have food and fiber, but it has come to us for manufactures because we of all nations have invented and produced those articles best suited to advancing civilization. Our foreign trade in manufactured articles has not grown because of any favorable governmental policy, but rather in spite of it.

Canada's Retaliation.

Let us see what the prospects for conserving the interests of our foreign trade are. Canada received our prohibitive tariff as a blow in the face. She retaliated by granting a preferential of 33 1-3 per cent. to Great Britain, and she now contemplates a maximum and minimum tariff. Her protective schedules range from only 25 to 35 per cent., and she finds them sufficient, but, like Mr. Chamberlain, she is desirous of having a tariff on which to trade.

Germany's Tariff Thunderbolt.

Germany, having concluded commercial treaties with seven of the leading countries of Europe, now denounces our agreement with her and gives notice that she is about to promulgate her new tariff. Germany is, next to Great Britain, our largest customer in the world, taking $214,000,000 from us in 1904. Since 1895 our trade with her has increased 133 per cent. As with most European nations, her blow is aimed first at our farm products, but many of our manufactures are included. The proposed increase of duties ranges from 25 to 380 per cent. upon some $43,000,000 worth of our exports.

Germany now accords us her minimum rates in consideration partly of the treaty of 1828, but the United States always has refused to give the European interpretation to the most favored nation clause, on the ground that the old treaty with Prussia does not necessarily include the German Empire. However that may be, should we attempt retaliation or grant any other nation more favorable terms than to Germany the German Government is authorized by the new law to impose a surtax as high as 100 per cent. upon our goods or even a surtax equivalent to the total value of the goods themselves. More than this, to quote the language of the law, "goods free of duty by virtue of the tariff may, under the same conditions, be taxed with a duty not exceeding 50 per cent. ad valorem."

* Extracts from an address before the National Association of Manufacturers, Atlanta, Ga., May 17, 1905.

Outlook in France and Italy.

Our third largest European customer is France, whose market we enter upon less favorable terms than any other nation. Our reciprocity treaty with France applies to only 4 per cent. of our total exports, while we are obliged to pay the maximum rates upon the rest. It is interesting to know that while our total exports to France in the five years following the signing of the treaty decreased some 22 per cent. our exports of articles favored by the treaty increased some 46 per cent. As there is a range of from 15 to 75 per cent. between the rates of the French minimum and maximum tariffs, it can be seen that our opportunities for increasing trade with the friendly Republic are not great. In comparison with those of other nations, in fact, we stand no chance at all. Our sales to France in 1898 were $95,000,000 and in 1904 they were only $85,000,000.

The Italian situation does not differ materially from the French. We enjoy lower duties upon a few products, but pay the maximum rates upon the remainder. The Italian field is, however, more desirable than some others, as the country is less developed and is in greater need of many of our staple manufactures, particularly iron and steel.

Russian Situation Appalling.

The Russian situation is little short of appalling. Accepting our interpretation of the most favored nation clause, Russia admitted us to her minimum rates, but our action in imposing a countervailing duty upon a little bounty fed sugar which she tried to send us has subjected our exports to the maximum rates, with an additional surtax of 30 per cent. upon several classes of our most important manufactures and 20 per cent. upon rosin and pitch, in which we had a large trade. We thus suffered an increase of duty in several lines of from 50 to 100 per cent., while the new tariff, just adopted, but not yet promulgated, threatens to annihilate our commerce unless we save it by means of reciprocity. In 1904, for the first time since 1883, we exceeded the export to northern Russia of that year, and until within two years our sales to Russia have been less than they were more than 30 years ago. The increase has been more than 100 per cent. since 1902. We are just at the beginning of an enormous Russian trade, but at present we are in no position to retain it. Even the reciprocity clause of the Dingley law, under which Mr. Kasson acted, expired by limitation in 1899.

Switzerland and Austria-Hungary.

With Switzerland we have been on bad terms since our termination of the ancient treaty in 1900. This was denounced by the United States because it was found to embody the European construction of the most favored nation clause.

Austria-Hungary still extends to us the privileges of the most favored nation treatment, and our trade with her has increased some 300 per cent. in ten years. She is preparing a new tariff, however, and there is no doubt, particularly in view of the German example, that our interests will be threatened thereby.

Some of the Business at Stake.

With Great Britain, our greatest customer of all, conditions remain practically unchanged, although you are familiar with the agitation of Mr. Chamberlain in behalf of limited protection for trading purposes. It is not for us to prophesy what the result will be. We can only recognize that the United Kingdom takes of our wares more than all the rest of Europe put together, the British Empire more than all the rest of the world.

Reciprocity may involve some readjustments, but I believe they will be trifling; they are not to be compared with the actual dangers which now confront us as a result of our timidity and our failure to read the handwriting on the wall. It may be that the tolerance of our great foreign customers like Great Britain, Germany, Canada and France—it may be that their patience is not yet exhausted, but the time approaches when it will be. They can afford a tariff war as little as we; but patriotic as well as commercial considerations enter into this situation. We have had a hint of that fact since our Senate insulted plucky little Newfoundland and turned her friendship into effective hostility. In the Newfound-

land case we find that the identical interest which thought it wise to block the Hay-Bond treaty is that which will suffer most through the failure of the treaty. It is to be hoped that our obstructionists in the United States Senate will not compel us to suffer many more lessons of this kind.

Puddled Iron Versus Soft Steel.

BY FRANK N. SPELLER, NATIONAL TUBE COMPANY, PITTSBURGH.

In a paper on the "Manufacture of Wrought Iron" at the Washington meeting of the American Society of Mining Engineers, James P. Roe of the Glasgow Iron Company, Pottstown, Pa., from wide experience in the manufacture of this material gives an interesting account of the reactions of the process and the characteristics of the product. However, many who have carefully looked into the matter of oxidation without prejudice, and compared the two materials under what are assuredly similar conditions, will object to the sweeping assertion, "That wrought iron resists oxidation better than steel is becoming the general opinion of those who have studied the question under actual working conditions."

It has been found after a wide investigation of the question with many users of iron and steel pipe throughout the country that

The Difference is More Apparent Than Real.

Mr. Roe states that the difference is naturally more apparent in thin objects. This seems to be a general experience, due perhaps to concentration of cinder and oxides at the surface in the coarse grades of iron used for roofing, &c. In iron of thicker section, especially where a better grade of material must be used, such as in the manufacture of pipe, this initial protection is lessened, and, where corrosion has once started, experiment and experience show practically the same rate of loss for iron or steel.

Some results of uncompleted tests on corrosion of a number of plates of soft steel and wrought iron which are insulated in aerated salt water for periods of four weeks at a time have just been received from our McKeesport laboratory. They illustrate the extent of surface protection under these conditions and are as follows:

Average Loss in Grams on Equal Areas (41.5 Square Inches).

	First period.	Second period.	Third period.
Steel	19.37	18.0	23.0
Iron	13.35	21.1	21.8

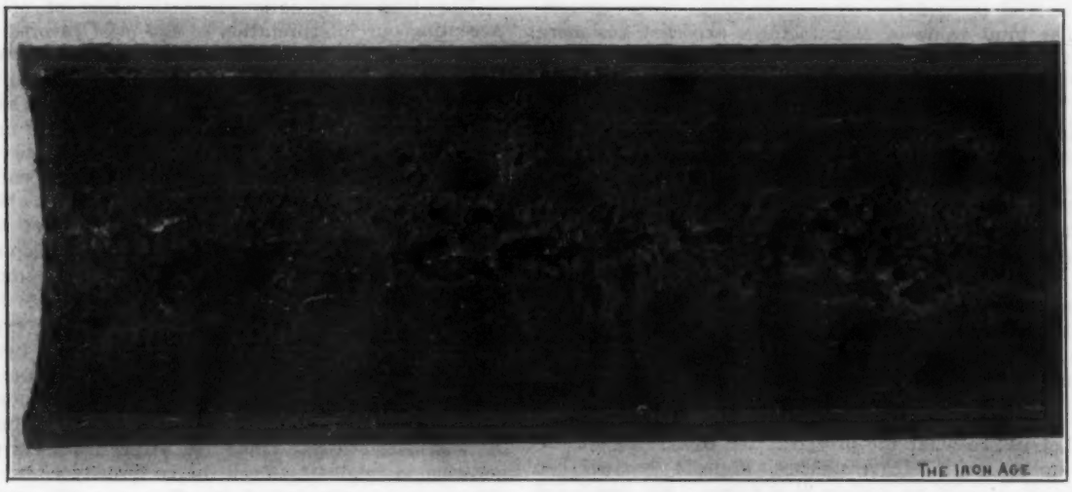
This is common iron carrying about 2 per cent. cinder. While this protection is evidently only skin deep, it gives iron the appearance of greater resisting power. This is misleading and may explain why the opinion of many, who may have only given the matter superficial study, disagrees with the result of tests which have been carefully conducted for years under what are essentially practical conditions.

It is necessary in order to make a strictly comparative test under fixed conditions that such tests be conducted on a somewhat limited scale, but the fundamental conditions of corrosion—namely, air, carbonic acid, &c., in the presence of water and other reagents—can be faithfully reproduced uncomplicated by galvanic action, electrolysis and other variable influences. Such tests have generally shown little difference between iron and steel, but

The Effect of Any Change in Environment

is usually quite marked. As an instance, from practical working conditions showing the effect of a slight change in surrounding influences the following case recently brought to our notice is rather significant:

A portion of a 3-inch wrought iron pressure line which had been in service only one year began to leak and show signs of active corrosion on the inside. As iron had been in use in this mill for 15 years with water from the same source with no trouble, it was inferred at first that the failure was due to soft steel pipe having been used on this particular line. However, analysis of the portion which gave out showed it to be wrought iron. The complaint that this was steel pipe led to a thorough investigation of the case.



Photographic Reproduction of a Corroded Iron Pipe.

The sections corroded were laid horizontally at the top of the system. When opened up the pitting was found to be confined to a strip of the upper interior surface of the pipe less than 2 inches wide. A photograph of a half section of a corroded portion of the pipe is reproduced herewith; it will be seen that toward the sides no unusual corrosion took place (the same being true of the lower half of the section), while at the top the pits extend almost or completely through.

The water, while apparently still good looking, it appears has been contaminated by increased amounts of sewage during the past few years. The interior of the pipe showed distinctly in place a glutinous skin of decomposing organic matter. Analysis of the pipe gave:

	Outside. Per cent.	Pitted surface. Per cent.	Outside. Opposite pits. Per cent.
Silicon	0.19	0.13	0.090
Sulphur	0.018	0.015	0.029
Phosphorus	0.280	0.274	0.275
Manganese	Trace.	Trace.	Trace.
Carbon	Trace.	Trace.	Trace.

The material is evidently wrought iron of average grade. An analysis of the residue scraped from the corroded portion showed the bulk of this to be oxide of iron with some organic matter, considerable combined CO_2 and 0.68 per cent. sulphur; about 0.15 per cent. sulphur was combined as ferrous sulphate.

The data collected appear to point to decomposing sewage matter as the origin of the corrosion. The

H_2S and CO_2 produced, probably mixed with a certain amount of air collected in this trapped portion of the system, corroded the iron very quickly. Somewhat similar conditions were observed in a natural gas line where the gas carred 2 per cent. H_2S. Some water on the bottom of the pipe kept that portion partially protected, while the damp gas above corroded the pipe seriously. Sulphide and sulphate of iron formed a large part of the rust in this case.

The above is one of those cases where slight change of conditions has accelerated the corrosion beyond all proportion. It will be noted that the corrosion is not at all uniform, as many believe will be the case with wrought iron. On the contrary, the pitting is deep, while some adjoining parts of the metal are intact. If the corrosion had been at all regular on the section affected the pipe would probably have lasted much longer.

Care Necessary in Drawing Conclusions.

A little consideration of how conditions in practice are complicated and varied, even though apparently the same, should cause us to be careful in drawing conclusions therefrom. Conditions affecting corrosion are rapidly becoming worse; if this fact be overlooked the conclusion is often reached that the materials of to-day are inferior in lasting qualities.

To explain why wrought iron should reasonably possess such advantages, Mr. Roe states that "each grain or crystal is surrounded by an envelope of cinder"—"each fiber existing in a matrix of cinder." This may be an ideal structure, but the microscope fails to show the cinder in this desirable position. On the contrary, the cinder occurs mostly in irregular strings or layers, usually without regard to the boundaries of grains. A single grain often contains two or more strings of cinder. If the fibers were so enveloped in cinder they would not be welded together and the material would have little coherence.

Since iron pits as badly as soft steel under similar conditions, the explanation that manganese in steel causes this trouble will hardly hold good, iron being practically free from this element. In making experiments along this line about a year ago mill scale was noticed to be strongly electro-negative to iron (about 3-10 volt) and it was further noticed that steel or iron pits deeply and is attacked more rapidly close to attached mill cinder. This seems to account for most cases of pitting and applies equally to iron or steel. The important fact is that both iron and steel corrode, the rate depending on the influences at work. The need for adequate protection for these materials is daily becoming more urgent.

So far at least as Bessemer pipe steel is concerned experience is opposed to Mr. Roe's statement that "There is greater confidence in welded articles made of iron than of steel." Comparing wrought iron and steel butt welded pipe of a certain size, working records show nearly double the loss with iron of that on steel, this steel being made of welding quality. Transverse pulling tests show this butt weld on steel to be nearly 100 per cent. stronger than the same size and gauge made of wrought iron.

The New Fosdick Sixteen-Inch Engine Lathe.

One of the latest new designs from the Fosdick Machine Tool Company, Cincinnati, Ohio, is a 16-inch engine lathe equipped with a compound rest and a new instantaneous change gear device for the feeds and screw cutting. Figs. 2 and 3 show details in the construction of the speed box, which was patented by W. T. Emmes.

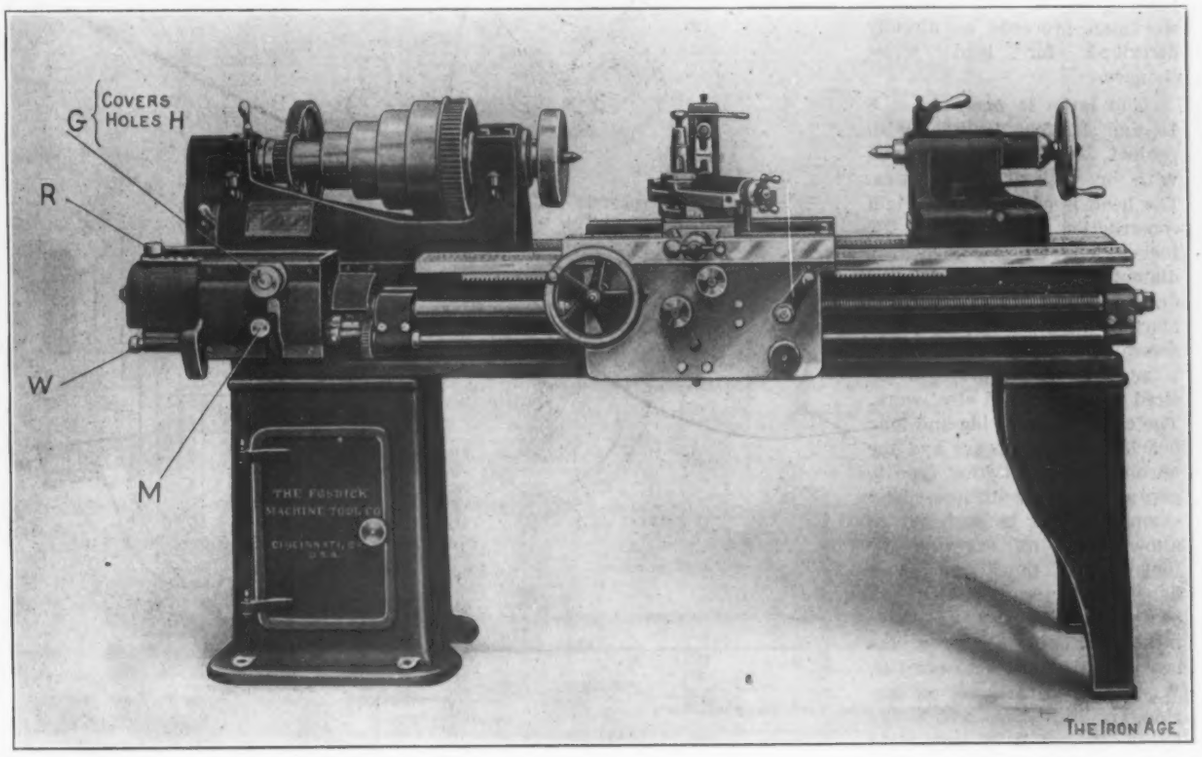


Fig. 1.—A New 16-Inch Engine Lathe, with Change Gear Feed. Built by the Fosdick Machine Tool Company.

Power is delivered from the live spindle A to the lead screw through the spindle B and the slip gear C engaging the gear X; and to the feed rod through the spindle B and the slip gear C engaging the loose compound Y and the gear Z mounted on the feed rod. To vary the speed between these two spindles, A and B, the slip gear D mounted on the shaft A is moved lengthwise by the yoke E mounted on the rack plate F. This is adjusted by the knob G, according to the front index plate H, and engages any one of the eight cone gears mounted on the shaft B. The shaft B with its cone of gears is mounted on the swinging bracket K, which is provided with an arm, L, and a pull pin, M. The pull pin engages in the rack plate F by dropping into the one of the eight holes in it corresponding to the gear engaged. The bracket K is mounted on the swinging shaft M, which is in line with the lead screw, and is in fact a continuation of it.

The compound slip gears O O being mounted on the shaft A are moved lengthwise by means of the yoke P attached to the knob R and are adjusted according to the

top index S. These gears engage with the intermediate T and the compound intermediate gears U and V mounted on the swinging bracket W.

The operation of the device is effected by disengaging the pull pin M and dropping the swinging bracket K, which allows the removal of the slip gear D to any desired position by the knob G (according to the front index H) and then re-engaging the pull pin M to lock the arrangement in place. In this manner the operator may obtain eight changes of speed. The bracket W may also be dropped and the slip gears O moved, so as to engage respectively with the gears T, U and V, by means of the lever R, according to the top index S. In this way five additional changes may be obtained which multiply the eight changes obtained from the cone of eight gears on the shaft B. The combination results in a choice of forty changes in all, without duplication.

In the case of feed changes the arrangement of the gearing allows a multiplication of the lead screw and thread cutting facilities by four times the turns per inch. In order to obtain the different feeds the slip gear C is engaged with the loose gear Y, and then the workman proceeds as already described for lead screw changes.

The lathe is made in 6, 8 10 and 12 foot lengths, with cabinet or standard legs and with or without an oil pan. The head is of heavy and rigid construction, with bearings 2¾ inches long by 2⅛ inches in diameter, so that a three-step driving pulley may be used in place of the five-step pattern, to accommodate a wider belt when a more powerful drive is desired for high speed steel work. The carriage has wide and long bearings on the shears and the apron is of box section type to give strength and stiffness. The compound rest is designed to allow using an extra heavy tool post. A taper attachment has been designed which can be applied to any of these lathes without changing the bed or fitting brackets upon it. When desired, a turret on carriage is furnished, which has five sides and is of very rigid design.

The following are the principal dimensions:

Swing over bed	16¼ inches.
Swing over carriage	10¼ inches.
Six foot bed takes between centers	34 inches.
Weight of 16 inch by 6 foot lathe	2,000 pounds.

A feature of the lathe is the provision of the same size heads on all of the screws which require adjusting, so that the tool post wrench may be used on all of them.

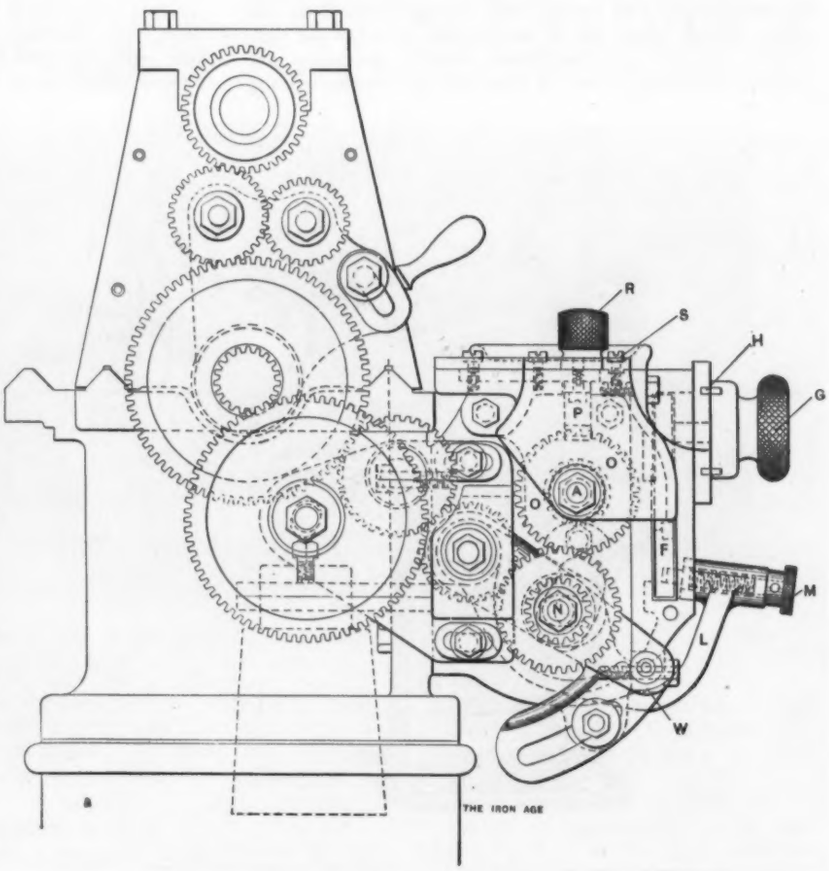


Fig. 2.—End View of the Head and Change Gear Box of the New Fosdick Lathe.

To make room for more modern mills, the forge department at the National Works of the National Tube Company, McKeesport, Pa., will be moved to the Pennsylvania Works, Second avenue, Pittsburgh. It is also likely that Nos. 1 and 2 puddle mills and the 19 and 21 inch finishing mills will also be moved from McKeesport to the Pennsylvania Works.

At Youngstown, Ohio, Thomas E. Davey, James A. Campbell and John Stambaugh have been appointed receivers of the Youngstown Bolt Company, whose plant is at Struthers, Ohio. It is said the company will be reorganized by Youngstown capitalists.

Ore Explorations Promise Activity.

DULUTH, MINN., May 20, 1905.—Indications point to a considerable increase of activity in exploration on the various Lake Superior ranges this summer. Manufacturers of churn and diamond drills and exploring contractors all show a growth of business, and there is an inquiry for options that presages much work. This is true of all ranges, especially those in Minnesota.

The Vermillion Range.

Somewhat surprising is the interest that seems to be awakened just now in Vermillion range lands. Within the past few days information has come to me of at least half a dozen parties of responsibility and strength who propose to drill there extensively. Some are looking the ground over now. Some contracts for diamond drilling have already been let. Work is to be done in townships 61 and 62, range 15, in 62-14, and in 63-11 and 10. Town 62-14 is liable to have the greater attention, especially in sections 10, 11, 14, 15 and 16, and perhaps in the northwestern corner of the township, where operations some years ago disclosed a very promising lead. It is also probable that some work will be done east of the terminus of the Duluth & Iron Range Railroad, and it may be that efforts now made to interest capital in that part of the range as far east as Gunflint Lake may be successful.

The Mesaba Range.

On the Mesaba range the chief work that has been looked for as probable this year is that on the west end, through Itasca County, where the Oliver Iron Mining Company, G. G. Hartley, the Rathbone Iron Company and others are working. Full mention has already been made of this work. But it now looks as though there was to be considerable on the east end. D. T. Adams and associates are to drill the old town site of Aurora, and the few buildings placed there two years ago are being removed prior to work. They have a lease from the fee owners and will have a drill on the

ground this week. This is in section 3 58-15, south of the Stephens mine and near the Pitt and Miller properties, all of which are now in operation. In the northeast corner of 59-14, where some ore was found some years ago, the Duluth & Mesaba Iron Company has taken about 900 acres under option and has begun work. Others are working in sections 15 and 22 of the same town. Explorers will go into the west part of 58-18 and the east part of 58-19, and there is to be some work in 58-17. All these localities have been under more or less constant exploration and examination since 1890, and that there is still sufficient hope of finding ore there, existing in the minds of some men with funds ample to carry on work, is an interesting commentary on the Mesaba situation.

Away from Lake Superior there are some eight or ten drills in the Deerwood region, Crow Wing County, Minn., where there has been a lesser number all winter. The results are about as were outlined in a report to the Orelands Company, quoted at length in this correspondence a month or more ago.

The Gogebic and Marquette Ranges.

Reference has been made to probable Gogebic work on the far western end, near Mellen, Wis. It now transpires that some work is to be done at the extreme east, running easterly from Sunday Lake.

On the Marquette exploration is under way around Neagunee by several parties, and more drills are to be set working shortly. There may be some exploration on the two narrow lines of the formation running westerly toward L'Anse, and the Cascade district is sure to receive a well merited attention this year to an extent that it has not had before. Work that has been under way close to L'Anse for a long time has been stopped, but those directing it state that it may be recommenced soon. A large amount of low grade ore was cut there with some better. This was in the immediate vicinity of the old Taylor mine.

The Menominee Range.

On the Menominee range there has been steady exploration for a long time. The methods of work vary considerably from those favored further west on the lake and they are meeting with fair success in many places. It looks as though at least two or three good mines would be added to the number around Iron Mountain and Iron River by the work that has been in progress recently. Little new exploration is beginning this spring, but there is a manifest intention to push the work that has been under way during the winter, much of which was not stopped or hindered by the short and sharp depression from which most of the remaining Lake districts are now recovering.

Central Wisconsin and Iowa.

There is little change in the nature or extent of work under way in the Baraboo region, which is still carried on by a number of explorers and consumers. There is no great expectation that the district can become an important competitor with the immediate lake districts, or can ship to furnaces outside the Chicago district.

Plans are under negotiation for a project that, if successful, will lead to the development of the iron ore resources near Waukon, in the northeastern corner of Iowa, and about 200 miles from Chicago. For many years it has been known that low grade iron ore existed there, and the Iowa survey has repeatedly called attention to it. Several cars of this ore were shipped to Chicago two or three years ago, but nothing came of it. Now, it is proposed to develop the lands, find if ore suitable for economical reduction exists there in quantity, and, if so, to erect furnaces and carry on an extensive operation. Men interested in the project have already taken the matter up with capital, and the outlook is understood to be favorable. Initial action on this proposition was begun two or three months ago by a man from Duluth.

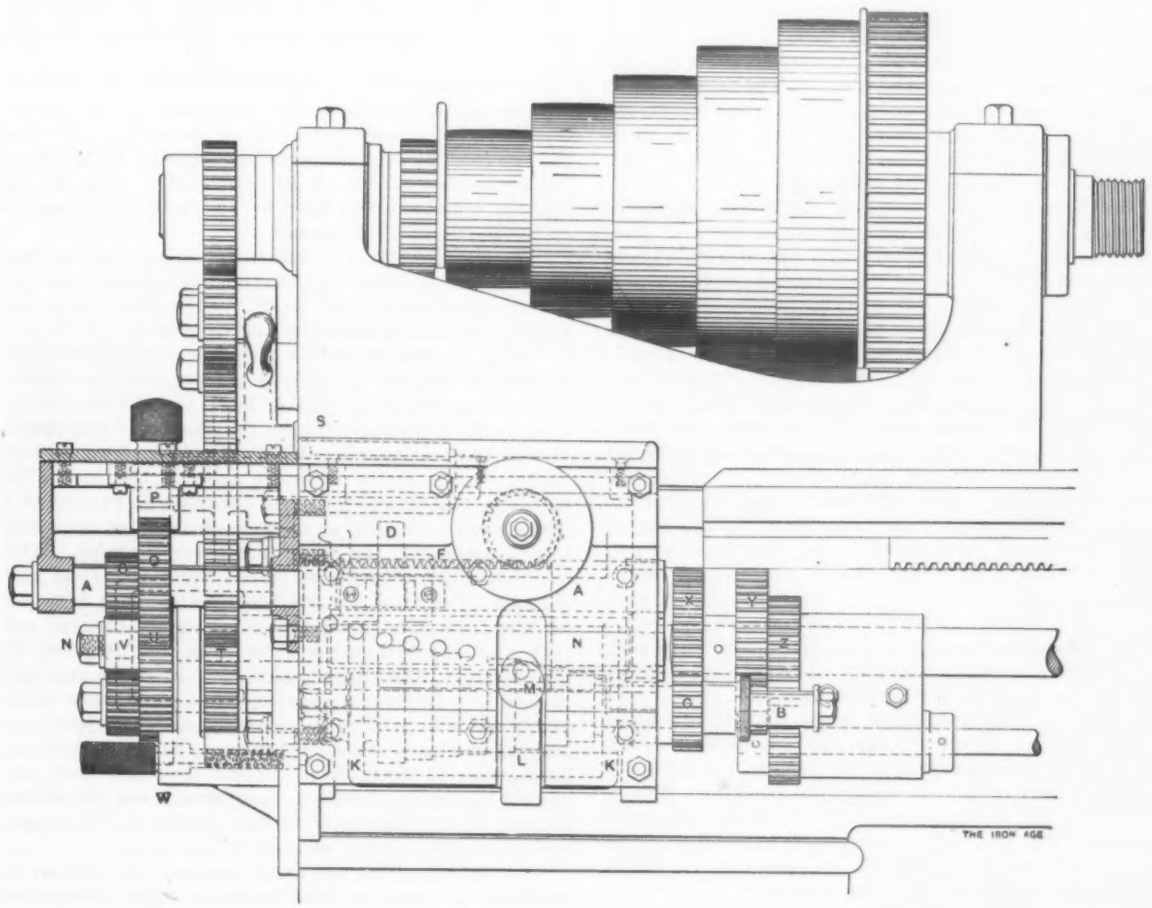


Fig. 3.—Front View of the Head Stock and Change Gear Feed Mechanism of the New Fosdick 16-Inch Lathe.

Away from Accepted Formations in Minnesota.

As the result of the Deerwood discoveries there has been renewed interest in iron ore indications around the head of the lake, and away from the accepted formations. Explorers are looking at lands south of Duluth about 35 miles, near the little village of Mahtowa, where there are some indications that may repay further investigation. Some drill work has been done by an auger bit, but nothing of an important character, and all that can be said is that may be worth while to look it over. There are also explorations started north of Duluth, along the north shore of Lake Superior and south of the Mesaba, in T. 55-5 and vicinity, and several ill informed persons are putting some money there. Three or four churn drills have been toted in through the almost interminable swamps between the locality and the Duluth & Iron Range Railroad. Then, too, prospectors are once more attracted by the stretch of country lying north from the western Mesaba, and supposed by many to be a western extension of the Vermilion. Twenty years ago, and more, the Minnesota survey reported the presence of low grade iron ore in "section 36-60-25 and in 60-22," and since then there have been occasional efforts to find better and more. These have been practically abandoned since the Great Northern Railroad pulled out its explorers in that region some years ago, but it is sure to be taken up again now that attention has been drawn to it.

On the Canadian Side.

The Lake Superior Company, Sault Ste. Marie, is husbanding its resources for the manufacture of steel rails, and is spending no money that can be avoided, and therefore exploration on the Canadian side of the lake is slow. It is at a standstill in the Michipicoten district. In the Atikokan there is some work, but it is more in the nature of beginning of development than of exploration, and is by the new Atikokan Iron Company which is drilling and tunneling into the base of the outcrop on the Hunter-McKellar lands, which it now owns. All work by the International Iron Company and others on Hunter's Island has ceased and shows no sign of resumption. The developments a few miles east from Port Arthur, Ont., about which a good deal was heard in local papers and by interested explorers last year, are very dull and quiet, and there is no great probability that much can be done there now. D. E. W.

The Wabash-Carnegie Connection.—At Pittsburgh the Wabash Pittsburgh Terminal Railway Company has awarded the contract for the construction of its part of the line to join the Wabash system with the Carnegie Steel Company's works. Under the agreement between the Carnegie and Wabash interests each will build about half of the line needed to connect the West Side Belt of the Wabash and the Union Railroad of the Carnegie Steel Company. The link will be completed by October. The contract let covers the grading and masonry for about 4 miles of single track line. The successful bidder was James D. Corcoran & Co. The cost will be about $200,000. The line will leave the West Side Belt at Smith's summit, between Saw Mill run and Lick run. It will extend across to the summit of Thompsons run in Mifflin township, where the Carnegie Steel Company acquired four years ago about 200 acres of land for its Wabash connection yard purposes. The Carnegie Steel Company, under the name of the Monongahela & Southern Railroad Company, will at once build its part of the line. This will leave the Union Railroad of the same company at Thompsons run and extend 4 miles up that run.

The May meeting of the Milwaukee branch of the American Society of Mechanical Engineers, held at the Hotel Pfister, May 17, marked the first anniversary of its formation. The branch now has a membership of 75 engineers employed in the large manufacturing establishments of the city. At the recent meeting C. J. Davidson, chief engineer for the Milwaukee Electric Railway & Light Company, read a paper on the subject of "Central Power Stations for the Use of Street Railways," drawing particular attention to the new Milwaukee power house and illustrating his talk with charts and diagrams.

The Bertrand-Thiel Process.*

BY JOHN H. DARBY, BRYMBO, AND GEORGE HATTON, ROUND OAK.

Many attempts have been made to accelerate the open hearth process of steel making, acid or basic, by increasing the size of the furnaces employed, perfecting the machinery for charging the steel making materials, using molten iron from the blast furnaces, regulating its supply and composition by the use of a mixer, &c., and the object in view has more or less been accomplished. But with all such improvements, in practice it is generally found essential to employ pig metal of special composition, which is not always readily obtained, and may be somewhat costly to manufacture.

The authors hope to show that by the aid of the Bertrand-Thiel process a variety of pig irons may be used, differing in composition, while at the same time the output of steel is kept at its maximum, and the quality of the product uniformly excellent. A. Ledebur† observes "that if two substances react on each other chemically, this reaction proceeds more slowly the more the two substances are diluted by other substances which remain inert. In other words the greater the excess of one of the two reacting substances the more quickly is the chemical conversion of the other completed." This, in the authors' opinion, is the basis for the use of two furnaces in the Bertrand-Thiel process.

The Bertrand-Thiel process of steel making has been described by the late Carl Bertrand in a paper read before the Institute in 1897; by P. C. Gilchrist, F. R. S., before the Cleveland Institute, and by others.

When in 1894 Bertrand and Thiel introduced their process as Kladno it was the practice, as open hearth furnaces existed at a suitable level, to hold the molten iron in these furnaces ready for the basic converters, and to effect a certain amount of refining by additions of ore and lime, in order to prepare the metal for blowing. A 20-ton open hearth furnace also existed at a lower level, sufficiently near to be commanded by a long trough connecting the upper and lower furnaces. With these conditions it occurred to Bertrand and Thiel that preliminary refining, or roughing down, might with advantage take place in the upper or primary furnace, and that when the bulk of the phosphorus, and, incidentally, the whole of the silicon, with part of the manganese and carbon, had been removed, they would have metal highly suitable as regards composition and temperature for transfer to a secondary furnace, in which suitable proportions of scrap, iron ore and lime had been previously charged and heated, care being taken to prevent the slag from the primary furnace passing to the secondary furnace during the transfer of the metal.

Prof. H. M. Howe has aptly described the process as analogous to washing one's hands in water, so making them moderately clean, and subsequently changing to fresh water, where the final degree of cleansing can be attained. As by the medium of the first washing a moderate degree of cleansing is attained, so the feebly basic slag in the primary furnace is able to retain a large percentage of the phosphoric acid and silicon liberated by the oxide of iron. Slags from the primary furnace frequently hold double the percentage of phosphoric acid compared with the lime base.

The following is a typical analysis of primary slag when using phosphoric pig iron:

	Per cent.
SiO_2	10.22
P_2O_5	28.86
CaO	18.60
Fe_2O_3	6.70

Notice how feebly basic the slag is, and yet how perfectly the iron in the ore has been exhausted, while the slag is largely charged with phosphoric acid. A yield of 103 to 105 of steel ingots per 100 of metal is attained. This means saving in lime consumed to fix the phosphorus removed from the pig treated, and insures a high

* A paper read before the Iron and Steel Institute.
† *Stahl und Eisen*, vol. xxiii, pp. 36-41.

percentage of the phosphoric acid in the slag, usually over 90 per cent. of which is soluble, according to the standard test.

As Bertrand worked his process, six to seven 20-ton charges of soft steel per 24 hours were considered good practice for a pair of furnaces. At Brymbo, with a more highly phosphoric pig, seven similar charges per day during a week's working have been attained. At the Hoesch Works in Dortmund ten charges have been regularly produced per day.

Fast working means a reduction in the cost of conversion, so that at present, taking into consideration the outlay involved, the Bertrand process may claim to be operated as economically as any other known method of converting pig metal into steel.

Bertrand's original plant, with furnaces at different levels, can only be used under special conditions, and had Into it the molten metal from the blast furnace is poured and retained for use as required, week end metal melted, desulphurization takes place, and the percentage of silicon is reduced. If a temperature of about 1500 degrees C. is maintained in the furnace cold pig iron is readily melted, and the wear and tear of the furnace is slight.

	Average composition of metal charged to mixer. Per cent.	Average composition of mixer metal ready for steel furnaces. Per cent.	Average composition of primary metal. Per cent.	Average composition of final metal. Per cent.
Carbon	3.250	....	1.800	0.11
Silicon	0.654	0.473	0.080	0.46
Sulphur	0.076	0.040	0.036	0.028
Phosphorus	2,420	....	0.580	0.035
Manganese	2.400	0.510	....	....

Note the reduction in sulphur and silicon in the mixer, and that the carbon remains almost untouched.

Mr. Springorum, managing director of Hoesch Works, Dortmund, has sent the following table showing the output of a 15-ton primary and 20-ton secondary furnace for five days immediately before the colliers' strike caused the stoppage of the works. In this time 908 tons of ingots were produced, showing a yield of 104.02 per cent. of metals charged.

			Composition of charges.												Production. Good material.			Consumption of iron ore, &c., per metric ton of good steel.							
1905.	Number of furnaces.	Number of charges.	Molten Thomas pig metal.		Ferro-manganese.		Ferrosilicon and spiegeleisen.		Light and plate scrap.		Broken molds.		Total.		Per 24 hours.		Per cent. of metals charged.	Weight of charge.		Swedish iron ore.	Mill scale.	Lime.	Limestone.	Gas producer coal.	Basic material.
Jan..			T.	Cwt.	T.	Cwt.	T.	Cwt.	T.	Cwt.	T.	Cwt.	T.	Cwt.	T.	Cwt.		T.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
9	2	9	135	11	1	11	1	2	28	8	..	..	166	12	173	6	104.03	19	5	4.50	0.96	1.70	1.24	5.38	1.04
10	2	9	131	19	1	11	1	6	30	..	2	..	166	16	173	11	104.02	19	5	4.32	0.80	1.68	1.30	5.58	1.06
11	2	9	133	3	1	11	1	2	29	10	2	..	167	6	174	1	104.04	19	7	4.68	0.90	1.60	1.24	5.34	1.04
12	2	10	148	3	1	14	1	4	34	12	..	10	186	3	193	12	104.01	19	8	4.66	0.44	1.66	1.24	4.80	1.04
13	2	10	146	5	1	14	1	10	35	..	2	..	186	9	193	18	103.99	19	8	4.10	0.30	1.64	1.24	4.80	1.04
120 hrs.		47	695	1	8	1	6	4	157	10	6	10	873	6	908	8	104.02	19	6						

= 7 tons 11 cwts. per hour over the whole period.
= 3 tons 15½ cwts. per furnace hour over the whole period.

Further return furnished by Mr. Springorum for week ending April 8, 1905. 61 charges. 1,149 tons 6 cwts. ingots produced. Yield, 104.5 per cent.

			Composition of charges.												Production. Good material.			Consumption of Iron ore, &c., per metric ton of good steel.							
1905.	Number of furnaces.	Number of charges.	Molten Thomas pig metal.		Ferro-manganese.		Ferrosilicon and spiegeleisen.		Light and plate scrap.		Broken molds.		Total.		Per 24 hours.		Per cent. of metals charged.	Weight of charge.		Swedish iron ore.	Mill scale.	Lime.	Limestone.	Gas producer coal.	Basic material.
Jan.			T.	Cwt.	T.	Cwt.	T.	Cwt.	T.	Cwt.	T.	Cwt.	T.	Cwt.	T.	Cwt.		T.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
3	2	10	143	19	2	8	1	14	29	18	..	..	177	19	186	2	104.53	18	12	3.74	1.26	1.88	0.86	5.00	1.08
4	2	11	158	1	2	11	1	6	30	6	..	..	192	4	200	17	104.50	18	5	3.48	1.18	1.86	0.86	4.64	1.10
5	2	10	143	4	2	10	1	6	34	18	2	8	184	6	192	10	104.48	19	5	3.58	0.88	1.76	0.84	4.84	1.04
6	2	10	145	4	2	10	2	13	34	12	..	..	184	19	193	6	104.52	19	6	3.40	1.14	1.76	0.82	4.82	1.04
7	2	10	144	12	2	10	4	4	25	18	..	8	177	12	185	12	104.50	18	11	3.98	1.26	1.84	0.82	5.02	1.08
8	2	10	143	15	2	14	1	4	34	4	..	16	182	13	190	19	104.55	19	2	3.36	1.10	1.78	0.84	4.88	1.04
144 hrs.		61	878	15	15	3	12	7	189	16	3	12	1,099	13	1,149	6	104.51	18	16						

= 8 tons per hour over the whole period.
= 4 tons per furnace hour over the whole period.

the disadvantage that when one furnace was under repairs the other had to remain idle. Many works have their furnaces arranged in line, and to suit this construction a convenient arrangement is to place a mixer at one end or in the center of a line of furnaces, commanding the whole by powerful overhead cranes and charging machines to charge the metal from the mixer to the primary furnace, and, after partial purification, to transfer again to the secondary furnace for final treatment.

Any scrap that it is desirable to melt up and make use of is charged into the secondary furnace, and the quantity so used is only limited by the time occupied in charging the furnace and melting. A pair of furnaces, working 16 tons of phosphoric pig in the primary, and 20 tons with scrap in the secondary furnace, would tap at least every 2½ hours, so that charging by pouring in molten metal and mechanical charging of the scrap are desirable and even necessary to obtain the best results.

A mixer is no part of the Bertrand-Thiel process any more than that of the Bessemer or Thomas processes.

In the case of two works employing the Bertrand-Thiel process, the pig iron containing a high percentage of phosphorus, it was found advisable to employ a gas heated mixer; in fact, a large tipping gas heated furnace.

The mixer is a costly piece of apparatus, and in order to get a better return in work done than is described above it was decided, as an alternative to working the process as originally employed by Bertrand, to carry the refining in the mixer still further, only raising the temperature sufficiently high to melt the slag while adding a considerable quantity of iron ore and lime.

	Average composition of pig metal charged into mixer as primary furnace. Per cent.	Average composition of refined metal from mixer as primary furnace ready for secondary furnaces. Per cent.	Average composition of final steel from secondary furnace. Per cent.
Carbon	3.25	2.10	0.169
Silicon	0.636	0.160	0.042
Sulphur	0.053	0.043	0.028
Phosphorus	2.42	0.930	0.032
Manganese	2.40	0.78	....

The average temperature of the furnace, looking on to the surface of the slag through the central door, was 1545 degrees C., as shown by the Wanner pyrometer, compared with the secondary furnace in full heat of 1720 degrees C. It will be noticed that the carbon largely remained, the silicon was almost all eliminated, the sulphur re-

duced and 61.5 per cent. of phosphorus removed. Counting the mixer as a primary furnace, three furnaces were engaged, the two secondary furnaces charged with 25 per cent. scrap working up the output of the mixer with 42 20-ton charges between three furnaces, or 14 charges per week per furnace. The added ore in the mixer was well exhausted. The speed of working was slower than the first modification of the process tried.

Average composition of mixer slag:

	Per cent.
Silica	15.5
Ferric oxide	9.0
Phosphoric acid	18.5
Lime	19.5

The original method of working employed by Bertrand has the advantage of faster working. The second method, although not so expeditious, involves less trouble in transfer, but is trying to the lining of an important furnace like the mixer. In both the methods described phosphoric iron was employed, made with specially low percentages of silicon and sulphur. As it had been noticed that sulphur was very readily eliminated in the primary furnace, irons were obtained containing high percentages of sulphur and silicon in order to test the process. The following are notable instances:

Percentage of sulphur in pig metal. Per cent.	Percentage of sulphur in primary metal. Per cent.	Duration of 18-ton charge in primary furnace. Hours. Min.	Percentage of carbon in primary metal. Per cent.
0.308	0 060	2 45	2.2
0.209	0.070	2 15	1.6
0.240	0.078	2 40	1.8
0.370	0.100	3 ..	0.9

The percentage of sulphur in the finished steel from the secondary furnace did not in any case exceed 0.05 per cent. Pigs with 2 to 2.5 per cent. of silicon are readily treated in the primary furnace, and owing to the short duration of the charge no excessive wear of the lining takes place. From experience gained the authors can state that by partial preliminary refining in one furnace pig of almost any ordinary composition can be commercially treated.

Motors Adapted to Belt Driven Machines.—As shop superintendents come to realize the advantages of variable speed motor drive for their various machines they naturally seek a system which is capable of being worked in with regular shop equipment, thus making it possible to prove the service of such a drive without extensive expense and experimentation. A system of this kind is supplied by the Northern Electrical Mfg. Company, Madison, Wis. The Northern single voltage variable speed motor, as its name indicates, operates from any ordinary two-wire single voltage shop circuit. It is a simply matter to apply Northern variable speed motors to machines, as the various types offered by the manufacturer make their application to standard machinery possible with but little alteration in the driven machine. Electrical variations as high as 6 to 1 are secured. By combining electrical and mechanical variations employing a self contained mechanism speed variations as high as 15 to 1 can be secured. The company has issued a special bulletin devoted to the application of motor drive to machines originally built for belted operation.

The Pittsburgh Coal Company Employees' Association's seventeenth quarterly report shows 18,746 shares of the company's preferred stock owned by the members of that organization. The net cost per share to the purchasers of stock from May 1, 1904, to April 29, 1905, ran from $38.72 to $43. The total benefits paid by the Accident and Death Association to April 30 were $202,770.62, the total number of men paying into the fund being 21,909.

The 11-story Tower Building, on Broadway, south of Wall street, the first steel skeleton structure ever erected in New York, is about to be torn down, after an existence of only 17 years, to make room for a 20-story building, to be erected partly on the Tower Building site and partly on adjoining ground. It was erected on a lot only 21 feet wide.

Pacific Coast Trade Prospects.

SAN FRANCISCO, CAL., May 13, 1905.—The condition of trade in California depends almost altogether on the crops, and their exact status can never be known until they are actually gathered in, although fair estimates can be made for some time previously. We are now well on toward the middle of May, and on the whole conditions have been favorable, although several times during the past three months dry weather or very heavy rains, each in turn, alarmed the farmer and orchardist, causing the reports to be spread of failure of fruits and cereal crops here and there. The condition now seems to be that the cherry crop is almost an entire failure but that most other fruits, including the wine grape, will yield abundant crops. As regards cereal crops, there has been some complaint that the late heavy rains have produced rust in some places, but on the whole it would seem that the rains will be more of a benefit than an injury. The San Joaquin Valley will produce both wheat and barley abundantly and the Sacramento Valley fair crops, though in some localities it is said there will not be much more than half a crop. It is fair to estimate the wheat crop of the present year at 750,000 tons at least and the barley crop at 600,000 tons. Should this be the case there will be a very big trade among the farmers this year and improvements of all kinds will be the rule.

The records of the building trade are the greatest ever seen in the State. In San Francisco for the past week there have been new contracts almost reaching $600,000 recorded. In other large cities of the State the same activity prevails, in the south the proportion to the population being much larger than it is in San Francisco. Hardware of all kinds will therefore sell well. The outlook for manufacturing centers of agricultural implements, such as Stockton, San Leandro, Benicia, &c., is exceptionally good. So also is this the case in connection with such articles of this description as are imported from the East.

It has looked for a time as if the action of the Standard and associated oil companies in putting down the price of oil to 11 cents or thereabouts had dealt a blow at the coast oil industry, but the determination of the independent producers to organize and find a way to the market themselves has caused a suspension of the threat to put this low price into effect. Consequently the increase in the production of oil will go on merrily this year, and the demand for tubing, casing, pipe and other articles needed by the oil producers will be as active as ever. The great impulse given to the lumber industry by the large demand from the East has given rise to projects for the building of more mills and the improvement of others, and hundreds of thousands of dollars will be spent this year in new machinery for the mills that are promised in the redwood districts of the State, while as fast as these districts are settled a demand will arise for hardware, machinery, &c.

The construction of the Panama Canal will call for a multitude of supplies, and the trade in this city feel that a reasonable proportion of them should be had from this side, inasmuch as the cost of transportation makes a difference in favor of San Francisco. The people of the Pacific Coast, especially those engaged in the hardware and iron and steel trades and the manufacture of machinery, feel that they should be given a fair show.

J. O. L.

The American Society of Refrigerating Engineers, headquarters 258 Broadway, New York City, has issued its first year book. The society was organized December 5, 1904, at New York, and elected the following as its first officers: John E. Starr, New York, president; H. B. Roelker, New York, and P. D. C. Ball, St. Louis, Mo., vice-presidents; Walter C. Reid, New York, treasurer, and William H. Rose, New York, secretary. The year book contains this list of officers and also the managers and members of the various committees, the charter members and charter associate members and the constitution and by-laws.

Federal Control of Freight Rates.

Strongly Opposed by Prominent Iron and Steel Men.

WASHINGTON, D. C., May 23, 1905.—The Senate Committee on Interstate Commerce during the past week has heard a number of prominent representatives of the iron and steel industry on the subject of the desirability of increasing the powers of the Interstate Commerce Commission or otherwise extending the Federal control of freight rates. The witnesses heard were practically unanimous against placing in the hands of any Government official or commission the power to fix rates, and it appears to be the general consensus of opinion among the big operators that the elastic methods by which the roads now regulate their own rates to meet changing conditions are far preferable to the hard and fast rule which it is assumed a Governmental commission would be obliged to enforce to avoid all forms of discrimination. The committee will probably conclude its hearings in another week, and will then consider the matter of drafting a bill to amend or supplement the present interstate commerce law. Whatever measure is recommended by the committee it is a foregone conclusion that nothing so radical as the Esch-Townsend bill, passed by the House last winter, will be reported to the Senate.

The representatives of the iron and steel industry heard during the week were E. H. Gary, chairman of the United States Steel Corporation; F. J. Hearne, president of the Colorado Fuel & Iron Company; Don H. Bacon, president of the Tennessee Coal, Iron & Railroad Company, and William S. Pilling of Pilling & Crane of Philadelphia. In addition, Brooks Adams, representing the Spokane Chamber of Commerce, presented a statement urging reforms in the present system of making freight rates for the north Pacific Coast, which it is alleged discriminates against certain communities to such an extent as to prevent them from engaging in the manufacture of articles in which iron and steel are the chief components.

President Gary's Views.

President Gary of the United States Steel Corporation testified not only with regard to the subject of freight rates, but concerning the sale abroad of American products at less than domestic prices, and was cross examined on this subject at length by Senator Newlands of Nevada, who also interrogated the witness with regard to the "community of interest" said to exist in certain cases between large manufacturing companies and the railroads handling their products. In reply to questions, Mr. Gary stated that the United States Steel Corporation handled about 100,000,000 tons of material, raw and finished, per annum, and paid to outside railroads about $75,000,000, besides hauling its own freights over 1000 miles of railroad owned by the company. As a shipper, he said, he was generally satisfied with the freight rates charged by the leading roads and had no cause of complaint. He knew of no rebates or discriminations in the last two or three years. Chairman Elkins then called Mr. Gary's attention to complaints with regard to concealed rebates alleged to have been granted to certain large shippers in the way of allowances for terminal and switching charges, and asked him if he knew of any complaints of that character. In reply, Mr. Gary said:

"We have one railroad particularly, the Chicago, Lake Shore & Eastern Railroad, at Chicago, which is spoken of by the Interstate Commerce Commission as a terminal railroad. I think the term is hardly a legitimate one, because that railroad has about 350 miles of track, not to be exactly accurate. It has about 10,000 cars. It has about 75 engines and is a very costly property. That railroad has been receiving a division from the trunk lines bringing coke from the East to the Illinois Steel Works in Chicago. The capital stock of this railroad is owned by the Illinois Steel Company. A division has been allowed, and we have always believed that division to be fair and just and reasonable, and not any more than was allowed to other connecting railroads under similar circumstances. However, the Interstate Commerce Commission lately rendered an opinion in which they stated the division allowed to the Chicago, Lake Shore & Eastern Railroad was excessive. That opinion was rendered without giving our interests any opportunity to be heard. I think it was the result of a mistake. When the Commission adjourned, I understood it was stated of record that an opportunity would be given our railroad company to introduce evidence. That was overlooked and the opinion was rendered without that hearing. However, since that time we have had a great deal of discussion with the different railroad companies concerning this matter, and they have decided to reduce the amount of division to the Chicago, Lake Shore & Eastern. I suppose we shall accept that and be satisfied with it, although our people are still of the opinion that the amount allowed before was not unreasonable, and I think it can be shown to a demonstration that the amount allowed is not any more per mile than the rate established by the Illinois Railroad and Warehouse Commission.

"We have in other places a few terminal railroads. Those railroads have been receiving $2.50 a car. In a recent decision of the Interstate Commerce Commission in Chicago, known as the 'International Harvester Case,' that Commission decided that $3.50 a car was reasonable, and we have only been receiving $2.50, and that is no more than other railroads generally receive for similar service. I think the facts I have stated answer fully your question and show that we have not been receiving discriminating favors."

Rebates Formerly Paid.

In reply to a question by Senator Newlands, Mr. Gary said that he did not doubt that in times past large amounts were paid by the railroads in the form of rebates to favored shippers, but that since he became president of the Federal Steel Company upon its organization in 1898, he did not believe that any rebates had been paid. As to what had caused the cessation of the payment of rebates, he said:

"I have no doubt the friendly disposition and consultations between the railroad companies and the manufacturing companies has had a good deal to do with it; there is no doubt about that. I know that it is true in our case. As applied to railroads and shippers generally, of course, the Elkins law has had a very good effect; there is no doubt about that. But going back to the time when the Federal Steel Company was organized, some of the highest railroad officials, the presidents of the railroads whose companies did a great deal of business for us, came into consultation with us, and these questions were discussed, and we both agreed that we would rather do business on a business basis and a fair basis, and we did not care for favors to ourselves provided they were not extended to other manufacturers in the same lines of business, and so far as our case is concerned I think that is the way that the previous system, so far as it existed, was abandoned."

Senator Newlands suggested that it was the sharp competition between railroads for business that brought about the system of rebates and that this competition had been materially diminished by the consolidation of the roads and by the creation of a "community of interest," to which the witness assented. Mr. Newlands then asked if a great concern like the United States Steel Corporation did not have it in its power to tempt railroads to grant rebates by offers of large tonnage, to which Mr. Gary replied: "So far as our corporation is concerned it has been forced to give the railroads all the business they could do and more too—all of them."

Mr. Newlands suggested that if a period of depression in the steel business should ensue the great producing corporations might bring about a renewal of the former system of rebates, to which Mr. Gary responded that such a thing was possible, adding: "As a newspaper man I used to say that there is lots of human nature in mankind."

The following colloquy ensued between Mr. Newlands and Mr. Gary:

Special Export Freight Rates.

"When you have a large amount of steel for export do you apply to the railroads for a special rate?"

"We have on one or two occasions."

"And in that case make the special rate, and then publish it for the period prescribed by law and it becomes a legal rate?"

"That has been done."

"Has not that been done sometimes in such a way as to take care of a particular shipment without inuring to the benefit of the entire shipping public?"

"I think not, so far as I know."

"It is not done for a particular limited time and for a particular shipper?"

"I know of no discriminations of that kind; no."

"You could first lower the rate by publishing a lower rate, and then, after the shipment was accomplished, you could advance the rate and publish the advanced rate?"

"If that is a practical question, you can, perhaps, answer that better than I."

"It has been claimed that the men who were interested in these great producing corporations, men of large wealth, have also become interested in the transportation systems of the country, and that the union of the control of both production in certain products and transportation would give them a great advantage. Do you think there is anything in that?"

"Well, I think the doctrine of 'community of interest' in a measure has been a disappointment to some people at least."

"But I am talking now not simply of the fact of the community of interests, but the practical control of many of the railroads of the country by the men who have been successful in bringing to their high efficiency some of these great industrial corporations. Now, when that condition exists, I want to ask you whether you think it is a condition that is really prejudicial to the interests of rival producers, whether it is possible to avoid under such a system preferences to the great producing and industrial corporations?"

No Wrong in Community of Interests.

"Well, I think, if one man was initially in the directory of a manufacturing company which had a large amount of business to give to a railroad corporation, and was also an initial director in a railroad company that desired a commodity produced for transportation, that fact should be of benefit to both the railroad and the manufacturing company. It does not appear to me that that is wrong legally or morally. I do not see why it is not perfectly legitimate if the railroad company received the regular published rate and no more. If the manufacturing company in that case pays as much to the railroad for the freight as any other manufacturing company would be compelled to pay, the mere fact that the railroad is willing to carry that particular freight, or that the manufacturing company is willing and desirous of giving its business to that particular railroad instead of some other railroad, does not seem to me to antagonize any law."

"But is not that union of control likely to result in certain preferences being given either in the rate itself or in the service or in the administration in such a way as to give the rate producing corporation that controls that road an advantage?"

"If that is equivalent to asking me whether or not pecuniary interest does not amount to a temptation, then, perhaps, I would have to answer your way; but it does not follow that there would be a result which is wrong, and I do not know that there has been any in our case."

Low Prices for Export.

Taking up the subject of the sale of goods abroad at less than domestic prices, Senator Newlands asked the witness concerning the proportion of the product of the United States Steel Corporation marketed abroad, to which Mr. Gary replied that at present the company is shipping about 1,000,000 tons a year, or about one-tenth the output. Sometimes prices for export were made at less than domestic rates, but by no means always. At present, he said, prices are not materially different on leading articles. Shipments are now being made to Africa, South America, Japan and many other neutral points. Very little steel is being sent to the continent of Europe, but more or less girder rails are being sold in England and Scotland. At present no rails are being sold in Canada, but the last sales made there were at about $6 per ton less than the price in this country, but water transportation reduced the margin somewhat. A good many rails have been sold in Mexico from time to time, but usually for about the domestic price or within $2 of $3 of that figure. In times past the margin had been as great as $6 or $8 per ton. In reply to a request from Mr. Newlands for a general statement of the reasons for these differences in price Mr. Gary said that the question was a large one, and added:

"Sometimes it is advisable to use foreign countries for what we call a dumping ground. That is done by all manufacturers, more particularly Germany, but also England and other manufacturing countries. We can afford at times to sell a surplus product abroad at cost, or even less than cost, because of the reduction, as a total result, in the cost of manufacture of that particular commodity in the mill, which is kept running to its full capacity; and the result is that it is beneficial to the manufacturer, and in the main beneficial also to the domestic consumer, because the manufacturer is able to produce a total result at less cost. And then there is another reason which, of course, is obvious. We have, as you readily understand, a very large number of employees, aggregating something like 165,000 men. Now, if our mills are shut down at any time, in any particular locality, it is not only to the great detriment of the men themselves, but it is to our detriment, because our organization is interfered with, our men become disbanded and disorganized and leave us and go elsewhere, and it is decidedly for our interest, and also in the interest of our workingmen to keep our mills running all the time."

"Now, is your ability to sell at a less price to these outside countries dependent at all upon the fact that you receive lower rates of transportation for export than you do for your domestic steel?"

"It is because it is absolutely necessary for us to receive some lower cost of transportation, in order to get cost, or approximately cost, that the reduction is asked and received. If we had to pay the ordinary full tariff rate, the amount that we would receive for the particular commodity exported would be so small that we could not afford to do it. The loss would be too great. And it is because the railroads realize that it is decidedly for the benefit of the manufacturing company, the purchaser in general, and the workingman, and the people of this country, who get the benefit of all money that is brought from abroad in this country, that the railroads join us in that idea. The rate is made at particular times. I do not mean to say for one particular day or month, or a particular commodity, but depending upon prices abroad."

Testimony of President Hearne.

President Hearne of the Colorado Fuel & Iron Company was interrogated by Chairman Elkins with regard to the magnitude of the business of his company, the extent of its private lines of railroad and terminal facilities, and as to the desirability of increasing the powers of the Interstate Commerce Commission to fix freight rates. Incidentally, Mr. Hearne explained the alleged discriminations in favor of the Colorado Fuel & Iron Company by the Atchison, Topeka & Santa Fé Railroad, which have been the subject of so much newspaper discussion. Said Mr. Hearne:

"We are engaged actively in business over three or four States and Territories. Our market is from the Missouri River to the Pacific Ocean and from British Columbia to the Gulf of Mexico. We are producers of about 6,000,000 tons of coal annually and about 1,500,000 tons of coke. These products are derived from 39 coal mines and about 3500 coke ovens, besides a considerable product we market for other producers. We are also engaged in the manufacture of various products of steel and iron to the extent of about 2000 tons daily. Our mines are at various places in southeast Colorado, some are in New Mexico, some in Utah and some in Wyoming. We ship over all the lines practically in the West, excepting the Northern Pacific and the Great Northern; those lines we do not reach. My experience began in 1867 as a civil engineer, and at that time I was chief engineer of a Western railroad for five years, until 1872. From that time until the present, for about 33 years, I have beeen engaged in the manufacture of iron and steel. We have in our outfit in Colorado 178 miles of railroad tracks, which are under my direction. The capital stock of the Colorado Fuel & Iron Company is $46,200,000. There is $44,200,000 of common stock and $2,000,000 of preferred stock."

"Now, so far as your experience goes as a shipper and manager of these great works, have you any reason to complain of rates being too high, or have the rates been satisfactory to you as a shipper?" said the chairman of the committee.

Mr. Hearne replied:

Railroad Managers Reasonable.

"My experience has always been that by coming in contact with the traffic managers of the carriers I have always been able to get what I was justly entitled to. I am not aware that I have ever been discriminated against. Sometimes matters have not come my way quite as promptly as I thought they ought to, but the managers have always risen to the occasion and have been solicitious of the district through which they have operated, and I think they have always done all reasonably in their power to promote the business interests of the communities with which they dealt. Where there is a mutuality of interests they usually succeed in coming to an arrangement satisfactory to both parties concerned."

"Do you know anything about rebates or discriminations?"

"I do not in my personal experience."

"And you think that in the last two or three years rebates and discriminations have ceased?"

"I think they have entirely ceased. So far as they have come to my knowledge they have ceased since the passage of the Elkins law. I think that law has had a very salutary effect, and I think that if it is enforced it will give the shippers all the relief they care for."

"You know the question pending before this committee and under investigation. The proposition is to confer per-

haps in a larger sense than under the present law, power to make rates upon the commission. What effect would that have, in your opinion, and do you favor that policy or principle, or not?"

Opposes Granting More Power.

"I am opposed to extending the rate making power to the Interstate Commerce Commission. I do not believe that the commission is capable, or that a commission can be appointed capable of handling the vast interstate commerce affairs of the country. Those matters are now handled by a vast army of trained traffic managers who are expert in their lines, and I should look for a very serious disturbance of business relations and the satisfaction and comfort of doing business if those changes were made. I believe the effect on the railroads would be disastrous. It would be disastrous to the holders of securities. It would produce extreme conservatism in new railroad construction, as well as in the purchases for operating purposes of existing lines. That in turn, I think, would be felt by every industrial establishment in the country. The railroads are very largely purchasers of material, and I think the fact of their retiring from the market as active purchasers would have a very decided effect on the active prosperity of the country."

"There are complaints of abuses in the way of switching charges and terminal charges. To be more explicit, switches of a mile of 2 miles, or a short line of a mile or 2 miles connected with industrial establishments of the country, it is said, get an arbitrary over the ordinary shipper, which is in effect a discrimination. Do you know of any such thing as that?"

"Our own personal relations to the railroads are that we have in the vicinity of Pueblo about 90 miles of trackage, and various belt lines, involving the expenditure of $2,500,000. When I say to you that we have not been able to pay fixed charges on these lines, I think it answers the question and shows that we have not been getting any more than we are entitled to. No part of that revenue, however, finds its way into the treasury of the Colorado Fuel & Iron Company; it all goes into the treasury of the transportation company; it is not a part of the manufacturing company at all, although I happen to be president of those two systems."

"You say you have not been discriminated against. Have you been discriminated in favor of?"

"No; we have not asked it. The fact is, that we are the only interest of that character in that section of the country. So there is no one practically to discriminate against us, and there is no one for us to discriminate against. There is no other iron industry west of the Missouri River until you reach the Pacific Coast."

Alleged Rebates by Santa Fé.

"Would you object to making a short statement of the so-called discriminations in the matter of the Colorado Fuel & Iron Company and the Santa Fé Railroad?"

"I would be very glad to do so. This matter has been made prominent largely by sensational newspapers. The railroads there of course have been extremely anxious to build up that section of the country and have done all in their power to aid impecunious operators, and they had a a policy some years ago of paying promptly for their fuel. For instance, a mining concern will deliver 10 or 12 or 20 carloads of coal to a railroad company, and at the end of the day's work, as soon as his bills of lading are signed, the agent of the railroad hands to the superintendent of the mines a sight draft upon the treasurer of his company, which is bankable at once. That avoids the delay of sending the fuel through to the consignee, with possible claims for short weight and poor quality and that sort of thing, and then probably having to wait a month or two for him to get around to his pay day. Those settlements used to be made daily; now they are made weekly, and it is practically shipping the product with a sight draft attached to the bill of lading—in fact, it is a little quicker than that. Take Deming as the common basing point. The rate is $4.05 a ton, of which $1.15 is the value of the coal and the $2.90 is the cost of the transportation. It is understood by the railroad company and it is understood by the shipper; it is understood by the buyer. This coal is delivered to Phelps, Dodge & Co. at Deming, with the $4.05 as advanced charges, of which $1.05 is for the coal. Then Phelps, Dodge & Co.'s road, the El Paso & Southwestern, has its rate, and when it is delivered to the consignee the entire amount of the freight, plus the price of the coal, is collected."

"The claim was that the other people were charged $4.05—was that the rate?"

Reasons for Different Rates.

"I don't know. I suppose that you refer to the Gallup district in western New Mexico. I don't know anything about their troubles, except this: That their district is about 200 miles west of Albuquerque. Our district is about 200 miles northeast of Albuquerque, or more nearly east of Albuquerque, so that the district is entirely separate and distinct. The coal produced by them is a lignite, carrying not more than one-half of the thermal units that our high grade bituminous coal in Colorado carries. If the railroads have not extended to them the same rate that they have extended to us in our district, I presume it is because the people of Deming and El Paso and in the copper districts of southwestern New Mexico and southeastern Colorado do not want that fuel at any price. A man cannot afford to pay $4.05, or even $2.90, on material that only carries one-half the number of thermal units."

"You say you would not like to see the rate making power placed ultimately in the Commission," said Senator Clapp. "We already have the law which places in the hands of the Commission ultimately, subject all the time, of course, to review by the courts, the power to prohibit a given rate. We also have the law now, since the Elkins bill was passed, under which the courts, as interpreted by the Supreme Court, can entertain a bill to enjoin a particular rate when that complaint is limited to the claim that that is a discrimination. The additional power which the Commission might be clothed with, so far as the power to fix a rate independent of the administrative features of the law, would be to fix this new rate with the same legal effect, whatever that might be, subject to the review as it must be, as they condemn the existing rate. Now, I would like you to explain how the mere addition of that power would work any serious harm—that is, supposing that that power was lodged there to be invoked only when the shipper and carrier could not agree—how the lodging of that additional power would work any great hardship."

"I think the proposition in sight makes the acceptance of the rate suggested by the Commission mandatory," replied Mr. Hearne. "There might be conditions under which it would be unprofitable, so that there should be some option to be exercised. I think it ought to stop short of being mandatory."

President Bacon Opposes Changes.

President Don H. Bacon of the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., was examined as to the terminal facilities controlled by his company and the delivery and switching arrangements existing with the roads handling the raw materials and finished products. The following colloquy ensued:

"The Tennessee Company owns at some of its works a few railway tracks. Nearly all of its switching is done by the Birmingham Southern, which now owns tracks that formerly belonged to the Tennessee Company, but that were sold by the Tennessee Company in the year 1889. We handle with our own locomotives over some tracks that we own and over tracks that are owned by the Birmingham Southern, much of the freight that we receive and that we ship, but in no place do we get any pay or are we allowed anything for the movements that we make. The coal that we mine, and the same is true of the iron ore, is delivered at our furnaces or mills either by the Birmingham Southern or by the Louisville, the Southern Railway, the Alabama Great Southern, or the Central Railroad of Georgia. And the shipments we make go over those roads and over the Illinois Central, and in all cases the freight is received by us or shipped by us without any payment to our company."

"What is the extent of your traffic?"

"We may own at the furnaces in Tennessee and at our furnaces and mills in Alabama less than 10 miles of track; probably not to exceed 10 miles of track."

"As I understand, these are short pieces of track in different places, that connect with the main line of railroads, for which you get no charge or allowance whatever?"

"Yes; nothing whatever."

And no allowance for switching charge?"

"None."

"The railroad rates in your part of the world are generally reasonable?"

"I had a comparison made two years ago. The rates on the Northern railroads, on products of the same character that we manufacture, in Illinois, Pennsylvania and Indiana the rates that we pay to the Louisville & Nashville, the Central Railroad of Georgia, the Southern Alabama, the Great Southern, which are the railroads that we ship over, were compared in many cases, and we found that the rates we paid were slightly higher than those paid by our competitors, but I consider the rate we pay as eminently fair."

"You know of no discrimination or rebates?"

"Not a cent."

"Now, you have had at times your rates reduced, have you not?"

"Yes; our rates have been reduced, and they have also been advanced."

"In other words, when your business was depressed your rates were reduced in order that you might go on and keep your mills open?"

"When the price of pig iron was very low—and of that commodity we shipped more than any other—the rates were reduced as far north as the Ohio River, that being as far

as the road entering our works reached. When the market for pig iron advanced, some time thereafter, the railroad rates were advanced."

"You have no special objection to that? You are willing to share your profit with the railroad company?"

"We were content when they made the advance and pleased when they made the reduction."

"What is the price of pig iron now?"

"At Birmingham about $13 for No. 2 foundry, and it has been down to about $9.

"You prefer to have the rates fixed by the railroads in the first instance, or do you prefer to have the Commission or some other body make the rates?"

"I think it is fair for the railroads to make their rates."

"And you would think that the existing condition of affairs is better than to try an experiment?"

"Yes."

Mr. Pilling Says Present Conditions Are Satisfactory.

William S. Pilling of the firm of Pilling & Crane, Philadelphia, was interrogated by the committee as to the developments in the iron and steel industry and also as to whether freight discriminations were now practiced in that section, which he emphatically denied. He said:

"Our business is in iron ores, coke, soft coal, pig iron and cement. We act as selling agents for three mining companies in the East, several of the large Lake Superior mines, and for some foreign mines in Nova Scotia, Sweden and the Mediterranean countries. We are also sales agents for five blast furnace plants, all in the East, and sales agents for a large cement company. Our business, under normal conditions of activity, amounts to about 1,500,000 tons of iron ore. We sell over 1000 tons per day of pig iron, about 500,000 tons of coal and coke, and 3000 barrels per day of cement. We have large financial interests in many of the companies we represent. In some cases we are the executive officers of them. Our business is principally in the East; we have offices in Pittsburgh, Philadelphia, New York and Boston. The products we ship do not usually stand very long transportation; they are more what you might call materials to be disposed of in the local markets.

"In former years we had great cause for complaint. We could hardly go into any large business without getting special rates. We also knew or suspected that every competitor had private rebates, which we seemed to be unable to get unless we discovered that our competitors were getting them. We also knew that there was discrimination in regard to car supply, and that, especially in my operations, was very serious. We have reason to believe, and are satisfied ourselves, that these abuses have all been corrected."

"That is, you know of no rebates being given at present?"

"I know of no rebates being given in that shape."

"How about discriminations?"

"And no discriminations. There is still considerable complaint about local rates on what is known as 'short hauls,' but those are taken up separately for each particular case. The whole freight situation in the iron business is now very complex, owing to the great number of districts in which iron is made under varying conditions. The great menace that I see in any central power fixing these rates would be that, through lack of understanding of the conditions, it might fix a rate to suit one section, which would be a great injustice to another, and before the other sections could present their cases and have them corrected they might be in the hands of the sheriff. Also the lowering of rates in one section would be equivalent to the advance of rates in another. It has been demonstrated that in times of great depression of the iron business in a canal district the iron can now go out of the other districts. It is a case of the survival of the fittest as regards each section. The concern which has the best plant and the best management will live and the others drop out. In times of prosperity all prosper about alike. There has been a general equilibrium established among the different districts, and we should consider it a very serious problem to attempt to take up detailed rates which might affect one section in New Jersey as compared with another.

"We also have in mind the fact, without imputing philanthropy to the railroads, that they are interested in building up these industries. The iron trade has prospered wonderfully. From 1,000,000 tons produced in 1860 it has gone up to a yearly rate of 24,000,000 tons now. Every ton of pig iron means 3 or 4 tons of raw material, so that the tonnage handled by the different railroads to-day in pig iron is over 100,000,000. We also know that the railroads are great customers in the iron business. The iron trade never prospers unless the railroads are large buyers. Anything that would halt their development or expansion would certainly reflect upon the iron trade and bring about great depression, and when the iron trade is touched all other trades suffer with it."

"Then you think the existing conditions can be safely left as they are?"

"We very much prefer leaving them as they are. The railroad officials thoroughly understand the situation. If a commission could be appointed and devote all its time to the iron trade alone, I think it would take all of its time to make an intelligent study of the situation and learn all about it, so that it could decide questions constantly arising. But if one section should, by some act of this Commission, be placed at a disadvantage, with the great amount of business before the Commission, that case might not be heard in time to save the perpetration of a very great wrong."

Discriminations Against Spokane.

Brooks Adams, representing the Chamber of Commerce of Spokane, Wash., made a statement to the committee with regard to the alleged discrimination of the railroads against the city of Spokane and in favor of Tacoma, Seattle and other points on the North Pacific Coast. He said it was significant that Spokane the natural distributing center of a territory having a population of 300,000 people, with transportation facilities unequaled west of St. Paul, the Missouri River, and Denver, and with a population of its own of nearly 75,000, had no manufacturing industries of any magnitude, and especially had failed to make any progress in the production of articles from iron and steel. The total value of the manufactured products of the city would not exceed $9,000,000 annually. This condition, he said, could not be altogether attributed to lack of population, newness and the speculative spirit, but was traceable directly to discrimination in freight rates; the railroads limited the distribution of the products of Spokane industries to a radius of 100 miles by discriminating rates. In proof of his statement he submitted the following schedule of rates on articles used in the iron industry:

Article. Carload shipments.	From—	Per 100 pounds. To Spokane.	To coast.
Steel plate	Pittsburgh	$1.23	$0.75
Sheets	Pittsburgh	1.28	.80
Angles, beams (channels, bars)	Pittsburgh	1.23	.75
Shafting	Pittsburgh	1.23	.75
Belts, nuts, washers, &c.	Pittsburgh	1.28	.80
Mining car wheels	Chicago	1.26	.85
Link belting	Chicago	1.23	.85
Pig iron	Alabama	*13.00	*13.00
Mining machinery	New York	1.68	1.40
Less than carload shipments.			
Belting	Chicago	3.13	1.65
Bar iron	Chicago	2.07	1.25

* Per ton.

Continuing, he said:

"As an example of how the 100-mile territory is being maintained to Spokane in the iron industry, take Wallace, Idaho, a distance of 102 miles and almost directly east from Spokane. Bar iron, Pittsburgh to Spokane, carloads, $1.23; local, Spokane to Wallace, 45 cents, making a total of $1.68 per 100 pounds to Wallace if handled through Spokane. Bar iron, Pittsburgh to Portland, 75 cents; local, Portland to Wallace, 82 cents; total rate per 100 pounds, $1.57, if shipped to Wallace via Portland, making a haul of 350 miles farther than if shipped via Spokane. Thus you will see that the coast to a point just 2 miles outside the 100-mile limit from Spokane has a rate 11 cents better than Spokane on this commodity. Again, the railroads charge a local rate of 45 cents for 100 pounds, Spokane to Wallace, 102 miles, as against 82 cents, Portland to Wallace, a distance of 452 miles. Again, mining machinery can be laid down in Spokane from Chicago at $1.40 per 100 pounds, while nearly all raw material used in the manufacture of mining machinery from the Pittsburgh district to Spokane costs from $1.23 to $1.33 per 100 pounds. This is but one of the numerous instances we can cite, but will serve for the purpose.

"Up until a little over a year ago the freight rate on pig iron from Alabama to Spokane was $21.90 per ton, or $6.80 per ton more than the coast rate from the same point. The only way local manufacturers were able to force a reduction of the rate was to buy the pig iron in a foreign market, have it shipped as ballast to Portland and thence by rail to Spokane. By this arrangement they were enabled to get their pig iron laid down in Spokane at a cost of $27.80 per ton, against $30.80 per ton if shipped from Alabama. The railroads, seeing that a reduction would have to be made to meet the so-called 'water competition,' secretly made a rate of $13 per ton the coast rate, which rate was later published. Now, then, the rates from the coast to Spokane, known as the 'pull back rates,' are as follows: First class, $1.48; second class, $1.33; third class, $1.02; fourth class, 82 cents. These are the rates above the coast rates that have to be paid by all merchants in Spokane who ship in less than carload lots. The fifth class, or carload rates, from the coast to Spokane, range from 50 to 70 cents per 100

pounds, and enter largely into the make-up of the so-called 'commodity rates' for Spokane—that is, the coast rates plus the fifth class or carload rates from the coast to Spokane constitute the Spokane commodity rates.

"The concession recently made at Chicago, giving to Spokane a distributing territory within a 100-mile radius, has helped a few lines, but, in the main, business men say that it is of no considerable benefit." W. L. C.

The New Amalgamated Scales.

The Amalgamated Association, in session in Detroit, Mich., has practically completed the wage scales governing puddling, finishers, hoop, sheet and tin plate mills for the year commencing July 1, 1905, and ending June 30, 1906. Some radical changes have been made in the new scales over the ones now in force, especially in the direction that advances in wages ranging from 7 to about 20 per cent. are asked in the different scales. Some important changes in foot notes have also been made, but the limit of output in sheet and tin plate mills has not been removed. It will be recalled that this was the contention in a number of strikes that have occurred during the year in the tin plate mills, notably at the plants of the Whitaker-Glessner Company, Wheeling, W. Va., and Martins Ferry, Ohio; also at the sheet plant of the Muskingum Valley Steel Company, Zanesville, Ohio. The strike at the latter plant lasted only a few days and the mill has been operated nonunion for some months.

In the past year the Amalgamated Association has suffered severely both in membership and finances, and the organization is weaker to-day in both these directions than ever before in its history. The association has made a radical change by appointing five vice-presidents, each to have a salary of $1400 a year and traveling expenses. One will be elected for all branches of the work east of the Alleghany Mountains and one each to act for the puddlers, the finishers, the sheet mill hands and the tin plate employees. The duties of these vice-presidents will be to adjust grievances and to travel over the country doing organization work and keeping in close touch with the lodges. The position of national organizer, held for some years by John Pierce, has been abolished. The different scales adopted by the association, and which will be presented to the manufacturers for signatures, are as follows:

The Puddling Scale.

The memorandum of agreement in the scale of 1904-1905 was adopted without change. The base of the boiling scale of 1903-1904 was adopted, which is as follows:

Based on actual sales of bar iron, as per conference agreement. Bar iron.	Boiling, per ton, 2,240 pounds.
1c.	$5.00
1 1-10c.	5.00
1 2-10c.	5.00
1 3-10c.	5.25
1 4-10c.	5.50
1 5-10c.	5.75
1 6-10c.	6.00
1 7-10c.	6.25
1 8-10c.	6.50
1 9-10c.	6.75
2c.	7.00

The foot notes under the boiling scale remain as before, except No. 12, which was changed to read:

Fifty cents per ton extra for all metal boiled, also for fomented swarth, turnings or malleable iron worked on clay or hot cinder fix or sand.

Five new foot notes were added, as follows:

No. 30. The price for swarth that is worked alone and fomented shall be the straight price for boiling.

No. 31. When a heat of swarth or a heat of half swarth and half turnings cannot be rolled in the furnace by reason of brass or other metals in the heat, and it becomes necessary to pull the heat out, 60 per cent. of the charge shall be paid for.

No. 32. That all scrap balls weighing over 400 pounds extra help shall be furnished and paid for by the firm.

No. 33. That all swarth used as a mixture with metal or cobbles shall be paid for at the price governing the metal.

No. 34. That the limit for working straight swarth shall be 3750 pounds on single and 7500 pounds on double furnaces. When one-third scrap, one-third wrought iron turnings and one-third swarth is worked, 11,200 pounds shall constitute a day's work on double cinder bottom furnaces, one-half the above, 5560 pounds, on single cinder bottom furnaces. Where one-half swarth and one-half wrought iron turnings or scrap is worked, 4000 pounds shall constitute a turn on single and 8000 pounds on double furnaces. When busheling on cinder bottom furnaces is done, 6600 pounds shall constitute a turn on single bottom furnaces and 13,200 pounds on double furnaces.

The muck mill scale was changed to 1903-1904 scale and provides that muck rolling shall be one-seventh the straight price of boiling. Two new foot notes have been added to this scale, as follows:

No. 8. That on muck mills working three turns, and the crews working 12 hours, they shall stop twice for meals, 30 minutes each time. This not to apply to combination mills.

No. 9. That the district board be empowered to make suitable scales or agreements between the parties who are engaged on muck mills, and when such arrangement is entered into a copy of same shall in every instance be sent to the national office.

Piles on boards was changed to the 1903-1904 scale and provides for an advance of about 10 per cent. The scale is as follows:

Based on actual sales of bar iron, as per conference agreement. Bar iron.	Piles on boards, per ton, 2,240 pounds.
1c.	$1.63
1 1-10c.	1.67
1 2-10c.	1.71
1 3-10c.	1.74
1 4-10c.	1.77
1 5-10c.	1.80
1 6-10c.	1.83
1 7-10c.	1.86
1 8-10c.	1.89
1 9-10c.	1.92
2c.	1.95

A new foot note has been added to this scale, as follows:

No. 4. That helping to charge means placing the piles on the peel. (This to be referred to Conference Committee.)

Busheling on sand bottom was changed to 1903-1904 scale and provides for an advance of about 10 per cent., the scale being as follows:

Based on actual sales of bar iron, as per conference agreement. Bar iron.	
1c.	$2.20
1 1-10c.	2.20
1 2-10c.	2.20
1 3-10c.	2.30
1 4-10c.	2.35
1 5-10c.	2.40
1 6-10c.	2.45
1 7-10c.	2.50
1 8-10c.	2.55
1 9-10c.	2.60
2c.	2.65

The foot notes are as before until Nos. 7 and 8 are reached, which were changed to read:

No. 7. That when light scrap is worked without turnings, 20 cents extra above light scrap price shall be paid.

No. 8. That when heavy scrap is worked alone on sand bottom without turnings, the price to be 20 cents above the price for busheling.

A new foot note, No. 14, was added, as follows:

No. 14. Where flat scales are adopted to overcome local difficulties in busheling mills, no such scales can be signed by any lodge belonging to this association that will conflict with the complete application of all clauses in the busheling scale from clauses 6 to 13.

Knobbling was changed to the 1903-1904 scale and provides for an advance of about 5 per cent., the scale being as follows:

Based on actual sales of bar iron, as per conference agreement. Bar iron.	Scrap, per ton, 2,464 pounds.	Refined iron, per ton, 2,464 pounds.
1c.	$4.60	$5.99
1 1-10c.	4.70	6.12
1 2-10c.	4.80	6.25
1 3-10c.	4.90	6.38
1 4-10c.	5.00	6.51
1 5-10c.	5.10	6.64
1 6-10c.	5.20	6.77
1 7-10c.	5.30	6.90
1 8-10c.	5.40	7.03
1 9-10c.	5.50	7.16
2c.	5.60	7.29

A new foot note was added, as follows:

No. 3. That all sheet mill scrap be cut or bundled, not to exceed 22 inches in length.

Heating slabs and shingling was changed to the 1903-1904 scale, which is an advance of nearly 10 per cent., the scale being as follows:

Based on actual sales of bar iron, as per conference agreement. Bar iron.	Shingling muck iron and re-hammered iron. 2,240 pounds.	Shingling charcoal iron. 2,464 pounds.	Heating, also shingling slabs and doubling. 2,240 pounds.
1c.	$0.73 4-10	$0.81	$0.73 4-10
1 1-10c.	.75	.82 8-10	.75
1 2-10c.	.76 6-10	.84 6-10	.76 6-10
1 3-10c.	.78 2-10	.86 3-10	.78 2-10
1 4-10c.	.79 8-10	.88 1-10	.79 8-10
1 5-10c.	.81	.89 5-10	.81
1 6-10c.	.83 2-10	.91 5-10	.83 2-10
1 7-10c.	.84 8-10	.93 3-10	.84 8-10
1 8-10c.	.86 4-10	.95 1-10	.86 4-10
1 9-10c.	.88	.96 9-10	.88
2c.	.89 5-10	.98 7-10	.89 5-10

1. That all finished steel one-third above the scale price for shingling be paid.

Bar and 12-Inch Mills.

This scale was also changed to the 1903-1904 scale and provides for an advance of about 10 per cent., the scale as adopted being as follows:

Based on actual sales of bar iron, as per conference agreement. Bar iron.	Bar rolling and heating, 2,240 per ton.
1c.	$0.61 7-10
1 1-10c.	.65
1 2-10c.	.64 4-10
1 3-10c.	.65 7-10
1 4-10c.	.67
1 5-10c.	.68 5-10
1 6-10c.	.70
1 7-10c.	.71 4-10
1 8-10c.	.72 7-10
1 9-10c.	74 1-10
2c.	.75 5-10

The foot notes are unchanged until No. 7 is reached, which in the new scale reads:

No. 7. Five per cent. less than above prices for rolling and heating steel (except hand rounds). But this is to apply only to rollers' and catchers' wages after roughing prices have been deducted, except on straight two-high bar mills, or when working axles.

No. 12. That the company pay firemen on coal heating furnaces.

No. 15. That two hours shall be the limited time for holding heats in heating furnaces after hot, where it is no fault of heater.

Prices for mills making a specialty of working pipe or skelp from iron or steel were changed to 1903-1904 scale, which provides that rolling shall be 55.5 cents per ton and heating, 61.7 cents per ton.

Guide, 10-Inch, Hoop and Cotton Tie Mills.

The base of these scales was changed to the 1903-1904 scale, which is as follows:

It is agreed that the base price at a 1-cent card rate based on actual sales of bar iron, as per conference agreement, with extras, shall be the straight $1.21 per ton for rolling, 61 7-10 cents for heating, 32½ cents per ton each for roughing and catching on guide, 10-inch, hoop and cotton tie mills, with 2 per cent. additional for each one-tenth advance or decline on said card from 1 to 2 cent card rate.

The rollers, heaters, roughers and catchers shall, each, be paid by the company. It is understood, however, that this arrangement shall in no way detract from the authority of the roller in controlling all hands on mill, including hiring and discharging, and, as heretofore, the roller shall be held responsible for the work done.

Bar mill heating price to govern base sizes alone.

In the foot notes No. 18 was changed to read:

No. 18. That two hours shall be the limited time for holding heats in heating furnace after hot, where it is no fault of heater.

Two new foot notes were added, as follows:

No. 20. When crop ends run excessive lengths an effort shall be made by the management to correct the abuse; but when said excessive crop ends are sold as finished material at any later period, full scale prices shall be paid. All faggots or scrap piles shall be piled on scales and an effort be made during the year to arrive at an equitable percentage.

No. 21. That the stranding and scrapping price shall be one-half the price paid for roughing; the same to be deducted from rollers' wages and paid by the company. This not to apply where present practice exceeds the above enumerated price.

Sheet Mill Scale.—Western Scale of Prices.

The base of the sheet mill scale was advanced 18 per cent. over the present scale, the new rates being as follows:

It is agreed that when the actual average selling price of Nos. 26, 27 and 28 gauge plain sheet steel f.o.b. mill is 2.30 cents per pound the wages for rolling on a sheet and jobbing mill shall be as follows, with 2 6-10 per cent. additional for each one-tenth advance above said 2.30 cents selling price and 2 6-10 per cent. decline for each deduction of one-tenth to said 2.30 cents selling price:

Gauges.	Price for rolling iron and steel, per ton, 2,240 pounds.
No. 8 and heavier	$3.49
Nos. 9 to 11	3.87
Nos. 12 to 14	4.65
Nos. 15 to 17	5.37
Nos. 18 to 21	6.53
Nos. 22 to 24	8.52
Nos. 25 to 26	9.80
No. 27	10.68
No. 28	11.14
No. 29	11.90
No. 30	12.77
No. 31	16.54
No. 32	20.13

Gauges.	Price for rolling on a 3-cent card, per ton, 2,240 pounds.
No. 8 and heavier	$3.18
Nos. 9 and 10	3.72
No. 11	4.26

This to apply only to jobbing mills rolling No. 18 and heavier over 48 inches in width.

Balance of scale to remain as at present.

Gauges.	Prices for spreading materials on jobbing mills, per ton, 2,240 pounds.
No. 8 and heavier	$3.82
Nos. 9 to 11	4.15
Nos. 12 to 14	5.10
Nos. 15 to 17	5.90
Nos. 18 to 21	7.17

In the foot notes No. 3 was changed to read:

No. 3. No. 7 and lighter, over 32 inches wide, worked from slabs, 10 per cent. extra when run over and annealed in open furnace, and for all bars and crop ends from plates to be worked into 16 gauge and lighter that are not cut to proper lengths and have to be spread on mills when worked, 7 per cent. extra.

Two new foot notes were added, as follows:

No. 24. That in all sheet mills where coal and coke are used the company shall pay for cleaning grates on sheet and pair furnaces.

No. 25. That men working under the control of the Amalgamated Association shall not wait in the mill longer than three hours without working. Cleaning is to specify when week's work is concluded.

Sheet Mill Hands Scale.

The base of this scale and the classification table is as at present. The foot notes in this scale were changed as follows:

No. 10. All sheet and jobbing mills working sheets over 30 inches wide shall be classed as large double mills. Mills working 30 and under in width are classed as small mills, but mills classed as small that work over 30 in width and not exceeding 34 inches, the day hands to be paid large mill prices while employed on these widths; and when a part of a turn is run over 30 and does not exceed 34 inches, the whole turn is to be paid for at large mill prices. This is to apply to mills classed as small doubling mills at present, and large mill prices be maintained on fire bed.

No. 13. All mills designated as averaging mills shall be allowed to average fire bed up to and including 28 inches wide and 93 inches long. But large mill prices shall maintain on fire bed containing a greater number of square surface feet than the above. This is to apply to fire bed worked from bars. And where a mixed turn is worked to average up and down.

No. 15. It is agreed if an average mill should work over 28 inches wide during the week it shall be classed as a small mill, and there shall be no averaging done during that week, and if any mill should work over 34 inches wide during the week the day hands shall be paid large mill prices for all orders during that week, and there shall be no more than three classifications from sheet to tin mills during the year.

No. 18. No sheet mill crew shall be allowed to make over 15 pairs per turn over the limit (150) to make up the number of pairs lost through starting up cold rolls, or through breakdown or any other unavoidable delays; pairs to be made up only during pay period in which shortage occurs.

The base and classification table in the scales for roughing and catching on sheet and jobbing mills are the same as in the present scale. The foot notes in this scale were unchanged, but a new foot note, the same as No. 18 just stated, was added.

Important Changes in the Tin Plate Scale.

The Amalgamated Association made very important changes in the wage scales governing tin plate mills, and

which will probably be very strongly contested by the tin plate manufacturers. In the present scale the preamble provides that an advance of 10 cents a box in the base price of tin plate was necessary before the men could secure an advance in wages. In the new scale this has been changed to 5 cents a box, while the base of the tin plate scale has been advanced to the 1903-1904 figures, which means an advance in wages of about 20 per cent. In other words, the reduction granted tin plate manufacturers in the spring of 1904 has been restricted in the new scale, and it seems certain that trouble will ensue if the Amalgamated Association sees fit to enforce this demand. The present price of tin plate and the dullness in demand do not seem to warrant the heavy advance of 20 per cent. asked for in the new scale. The preamble in the new scale was changed to read:

When a box of 100 pounds coke tin plates is selling at $3.40 the scale of prices as appears below shall be paid. On each 5 cents increase in the price per box 1 per cent. advance on the prices below shall be paid, and on each 5 cents per box decrease a deduction of 1 per cent. shall be made to said base. But it is understood that the wage list below is the minimum for the year ending June 30, 1906.

The new rates in the tin plate scale which prevailed up to the spring of 1904, and which are asked for the year commencing July 1, are as follows:

Gauge.	Roller.	Doubling.	Heating.	Catcher.	Shearing tin plate on squaring shears. (Per ton)	Screw boy. (Per ton)
Nos. 8 to 11	$1.71	$0.97	$0.98	$0.59		
Nos. 12 and 13	1.79	1.00	1.03	.62		
Nos. 14 and 15	2.07	1.16	1.23	.71	$0.41	$0.60
Nos. 16 and 17	2.77	1.58	1.52	.95		
Nos. 18 to 20	3.10	1.77	1.70	1.06		
Nos. 21 to 24	3.72	2.19	2.02	1.17	.50	.73
Nos. 25 and 26	3.94	2.30	2.22	1.24	.51	.80
Nos. 27 and 28	3.99	2.43	2.40	1.25	.53	.81
Nos. 29 and 30	4.18	2.75	2.68	1.43	.52	.81
No. 31	4.28	2.91	2.86	1.45	.53	.82
No. 32	4.47	3.06	3.01	1.52	.55	.84
No. 33	4.76	3.22	3.10	1.61	.59	.86
No. 34	5.29	3.44	3.39	1.78	.61	.89
No. 35	5.54	3.62	3.60	1.88	.63	.93
No. 36	5.91	3.72	3.74	2.00	.66	.93
No. 37	5.99	3.76	3.79	2.02	.68	.93
No. 38	6.05	3.84	3.85	2.05	.70	.93
No. 39	6.38	4.22	4.14	2.16	.72	.93
No. 40	6.72	4.77	4.83	2.27	.75	.93
No. 41	6.90	5.01	5.06	2.32	.76	.93
No. 42	7.08	5.23	5.29	2.38	.77	.93
No. 43	7.25	5.46	5.52	2.44	.78	.93
No. 44	7.43	5.69	5.75	2.50	.79	.93

Foot notes Nos. 6 and 23 in the tin plate scale were changed to read:

No. 6. Where improved squaring shears are used the company shall pay for opening packs and grinding the knives, and in mills where packs are cut into four or five cuts 10 cents per ton above scale price shall be paid, and 5 cents per ton additional for each extra cut thereafter.

No. 23. That on all orders over 80 inches long, regardless of width, the company shall pay man to help catcher pile same.

A number of new foot notes were added to the scale, as follows:

No. 25. That where tags are finished in less than 16 sheets to the pack, or if worked from a single bar and doubled three times, 25 per cent. extra shall be paid.

No. 26. That overweight secretary have privilege to examine weigh master's book.

No. 27. That shearman handling packs 50 inches long and over of one cut, the company shall furnish extra help.

No. 28. In all tin mills where coal or coke is used the company shall pay for cleaning grates and bottoms on tin and pair furnaces, cleaning to specify when week's work is concluded.

Tin mill limit of output is to remain the same as 1904-5, except that the foot note is changed to read as follows:

No. 1. On sizes 20 inches wide or over, containing 1148 square inches or over, an excess of 10 per cent. may be made, but in sizes less than 20 inches wide the excess cannot be made, and on 26 inches wide and over an excess of 15 per cent. on limit may be made.

The sheet and tin bar scales were adopted without change and will be as at present.

In the memorandum of agreement two new foot notes, Nos. 7 and 8, were added, as follows:

No. 7. That the charging time on Saturdays be seven hours.

No. 8. That company take cinder out of the pit from heating and busheling furnaces.

The Scale for Eastern Rolling Mills.

A scale for Eastern puddling and finishing mills in which the Amalgamated Association is recognized was adopted and will be presented for the signature of these mills. The scale is as follows:

The memorandum of agreement was adopted without change.

The boiling scale base was adopted without change, as follows:

Based on actual sales of bar iron, as per conference agreement. Bar iron.	Boiling per ton of 2,240 pounds.
1c	$3.75
1 1-10c	3.75
1 2-10c	3.75
1 3-10c	4.00
1 4-10c	4.25
1 5-10c	4.50
1 6-10c	4.75
1 7-10c	5.00
1 8-10c	5.25
1 9-10c	5.50
2c	5.75

Changed foot notes are as follows:

No. 7. That busheling one-third wrought iron turnings and one-third scrap on cinder bottoms to be 51 per cent. the price paid for boiling. This not to be applied to draft furnaces.

No. 9. Fifty cents per ton extra for all metal boiled, also for fomented swarth and turnings worked on clay or hot cinder fix on sand.

New foot notes are as follows:

No. 25. When a heat of swarth and a heat of half turnings or turnings and scrap when worked with swarth cannot be rolled in furnace by reason of brass or other metals in the heat, and it becomes necessary to pull the heat out, 60 per cent. of the charge shall be paid for.

No. 26. That all swarth used as a mixture with metals or cobbles shall be paid for at the price governing the metal.

Muck or puddle mill base and foot notes were adopted without change.

Busheling on sand bottom, based on actual sales of bar iron, as per conference agreement, is as follows:

Bar iron.	
1c	$1.95
1 1-10c	1.95
1 2-10c	1.95
1 3-10c	2.05
1 4-10c	2.10
1 5-10c	2.15
1 6-10c	2.20
1 7-10c	2.25
1 8-10c	2.30
1 9-10c	2.35
2c	2.40

Changed foot notes are as follows:

Wire and sides of sheet No. 19 gauge and lighter, when in bundles not heavier than 40 pounds and not exceeding 18 inches in length, the price to be 51 per cent. the price of boiling. When over 40 pounds, 25 cents extra shall be paid on the total tonnage of bundles used. Total bundles not to exceed 80 pounds to each ball.

The preamble of the bar mill scale was changed to read:

It is agreed that the following shall be the minimum on base price for 14-inch and bar mills, and that 2 per cent. shall be added for each one-tenth cent up to 1 4-10 cents, and from 1 4-10 cents up 4 per cent. shall be added. Some to advance as per conference agreement.

Base prices of Eastern bar mill scale were adopted without change from those of last year.

The preamble of the 10 and 12 inch mills was changed to conform with that of the bar mill.

The base prices of the 10 and 12 inch mills were adopted without a change from those of last year.

In foot notes for bar, 10 and 12 inch mills, No. 10 was changed to read:

Roughers shall not help to hold up hand rounds on bar mill.

The guide mill preamble was changed to conform with change made in preamble of bar mill scale. No change in foot notes.

In Eastern scale addenda, note No. 3 was changed to read:

On all finishing mills the last furnace shall not charge later than one hour after first furnace. On Saturday seven hours shall constitute a day's work from the regular time first furnace charges.

Sir Bernhard Samuelson Deceased.

LONDON, ENGLAND, May 13, 1905.—Another iron trade veteran has passed away in the person of Sir Bernhard Samuelson, in his eighty-fifth year. One of the pioneers of the Cleveland iron trade and a great advocate of technical education, he was the son of a Liverpool merchant. After being privately educated he entered a merchant's office in Liverpool. Here he remained for six years, and then went to the Continent in charge of the locomotive contracts of Sharp, Stewart & Co. of Manchester. He amassed a considerable fortune in private speculations, and returning to England in 1848 bought a small implement works and foundry in Banbury. In his hands it grew into a business of very large dimensions.

In the year 1853 Mr. Samuelson made the acquaintance of the late Mr. Vaughan, and beginning business in the north these two men speedily transformed Cleveland into the greatest iron producing center in the world. Furnaces were erected near Middlesbrough, but not content with making pig iron Mr. Samuelson determined also to make finished iron upon an extensive scale, and in 1879 he began the erection of the Britannia Iron Works, which cover 20 acres and are now the property of a limited company.

To Sir Bernhard Samuelson, probably, the nation is indebted more than to any other man for its knowledge of the relative position which England occupies among the competing industrial peoples of the European Continent and of the transatlantic States. In 1867, at the request of the vice-president of the committee of council in the Conservative Government, he visited the principal manufacturing centers of Great Britain and the Continent and reported on the education of the industrial population. The report was published as a Parliamentary paper, and was for years referred to in all debates on technical education. He followed this up by a Parliamentary inquiry into the education of the workmen of British manufactories in 1868, and was chairman of the committee, whose report was adopted by the House of Commons. He was a member of the Duke of Devonshire's Royal Commission on Scientific Instruction, which issued a valuable report, for which Sir Bernhard was responsible so far as it related to the science and art department. The recommendations of this report were acted upon by subsequent administrations, both Liberal and Conservative. He was a member also of the Royal Commission on Elementary Education, presided over by Viscount Cross.

He was appointed chairman of the Royal Commission on Technical Instruction, whose labors extended over the years 1882, 1883 and 1884 and embraced an examination into the systems in use in all parts of Great Britain and a great portion of the Continent of Europe. The exhaustive report of this commission has become the standard authority upon the questions with which it deals. In 1867 he prepared a series of reports to the Foreign Office on the subject of the iron trade between France and England in connection with the renewal of the commercial treaty with France; in 1873 he was chairman of the Parliamentary Committee on Railways, and in 1885 he occupied himself in an inquiry into Continental rates for the Associated Chambers of Commerce, of which body he afterward became chairman. He took a deep interest in the reform of the patent laws and was chairman of the committee which sat during two sessions to inquire into that subject. In 1888 he was appointed a member of the Parliamentary Committee for inquiring into the working of the education acts.

For his many public services he was created a baronet in 1884. He was a member of the Institutions of Civil and Mechanical Engineers and was the recipient in 1871 of the Telford Gold Medal for a paper on improvements in iron manufactures. He was a member of the Council of the Iron and Steel Institute, of which he occupied the presidential chair for two years, and he was a member of the Vigilance Committee of the British Iron Trade Association. In 1878 he was elected president of the Cleveland Ironmasters' Association, and he was the first president of the Agricultural Engineers' Association, to which post he was re-elected for three years in succession. As an employer he was liberal and considerate to his workpeople, while he gave generous support to technical schools and other institutions in Middlesbrough and Banbury.

S. G. H.

Statue of Abram S. Hewitt.

[*With Supplement.*]

We herewith present a photographic reproduction of the marble statue of Abram S. Hewitt in the Chamber of Commerce, New York, which was unveiled May 11. Mr. Hewitt was an active member of the Chamber of Commerce, his connection covering the long period of 42 years. As an indication of the high esteem in which he was held by that body, the fact may be mentioned that on April 5, 1900, a resolution was adopted that a gold medal be struck in recognition of his eminent services in the cause of civic rapid transit under municipal ownership, and that it be presented to him by the president. At the same meeting honorary membership was conferred upon him. He delivered two noteworthy addresses before the organization, one on the death of Queen Victoria, on February 7, 1901, and another on the death of President McKinley, on September 16, 1901.

At a meeting of the Chamber of Commerce, held February 5, 1903, President Morris K. Jesup announced the death of Hr. Hewitt, and suggested a statue to his memory, to be placed in the first of the spaces in the grand stairway, which were designed to be filled with the statues of men connected with the Chamber who had lived lives of usefulness and performed great deeds for the city and country. As the result of that recommendation the Chamber authorized the appointment of a committee, and under the authority thus delegated the following committee was created: Morris K. Jesup, chairman; William Butler Duncan, William E. Dodge, Andrew Carnegie, J. Pierpont Morgan, Jacob F. Schiff, Samuel P. Avery and Alexander E. Orr. Through the generous contributions made by the members of the Chamber of Commerce the committee was enabled to proceed at once with its work. The services of the eminent sculptor William Couper were secured, and aided by suggestions from Mr. Hewitt's family the statue was completed. It is made of pure Carrara marble and is a most admirable representation of its famous subject.

At the unveiling of the statue President Jesup made a few remarks, introducing Mr. Orr of the committee, who gave a brief account of the performance of its task and formally presented the statue to the Chamber, the receipt of which was then acknowledged by President Jesup. This was followed by an address on the life and services of Mr. Hewitt by Charles Stewart Smith. The address was a masterly effort. It has been reprinted by the Chamber of Commerce in pamphlet form. We take from the address the following tribute to Mr. Hewitt's character and attainments:

"Only a few can rise to conspicuous positions in several vocations as did Mr. Hewitt. Most men must select one, and work like slaves if they aspire to be leaders. He was a recognized leader in his business. His political career rose to the dignity of statesmanship. He was a practical philanthropist, understanding well the trusteeship of wealth. He valued money for the power it gave him to dispense it wisely, and generally without public knowledge. He was an educator of sound monetary and economic policies, and an orator of rare intelligence who commanded attention by force and clearness of statement."

At Cincinnati, on May 22, William Patten, a union iron molder, pleaded guilty to killing Samuel Weakley, a nonunion molder, last summer during a strike, and was sentenced by Judge Smith to 20 years in the Penitentiary.

The boiler makers in the employment of the Franklin Boiler Works, Green Island, N. Y., are out on strike.

THE STATUE OF ABRAM S. HEWITT IN THE CHAMBER OF COMMERCE, NEW YORK.

UNVEILED MAY 11, 1905.

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OBITUARY.

OTTO KROESCHELL, secretary of Kroeschell Brothers Company, boiler manufacturer, and secretary and treasurer of Kroeschell Brothers Ice Machine Company, Chicago, disappeared early in May and his body was discovered in the Chicago River May 17. Mr. Kroeschell left his home to go to his office and never appeared thereafter. It is thought that he fell into the river during a period of temporary mental derangement.

GEORGE W. DAVENPORT, third vice-president of the Niagara Falls Power Company, who died at Niagara Falls last week, was born in Fall River, Mass., 47 years ago. After graduating from the Massachusetts Institute of Technology he entered the employ of the General Electric Company, Lynn, Mass., and was rapidly promoted, being especially prominent in extending the business and handling patents abroad, and later with the General Electric Securities Company. He was treasurer of the Fore River Ship & Engine Company, Quincy, Mass., in 1902. About 18 months ago he accepted the position of manager of the offices of the Niagara Falls Power Company.

EDWIN MCCALLA DAVIS, who was for many years connected with the Niles-Bement-Pond Company, latterly as secretary, died at his home in Brooklyn, N. Y., May 17, after an illness of 18 months, during which time he suffered severely and was unable to attend to business to any extent. The deceased was one of the best known men in the machinery business in the vicinity of the Metropolis and because of his even disposition and admirable character he was especially popular with his colleagues. He was born in Philadelphia November 21, 1861, and after graduating from public school took a course in a Philadelphia technical institute and then entered the employ of William Sellers & Co. He remained with that firm for a little more than five years, during which time he was employed as a salesman and in other minor capacities. He entered the employ of Bement, Miles & Co. nearly 20 years ago. He began as a salesman and later he managed the sales department and occupied other important positions with the company. About four years ago, when the Niles-Bement-Pond Company was reorganized, he became secretary of the amalgamated concerns and held that position until his death. The interment was at Laurel Hill, Philadelphia. The deceased is survived by a widow.

ALFRED P. NIEBLING, purchasing agent of the New York Car Wheel Works, Buffalo, N. Y., died suddenly May 10, aged 36 years.

FRANCIS M. METCALF, president of the Westmoreland Malleable Iron Company, Westmoreland, N. Y., died May 11, aged 62 years. He served in the signal corps during the Civil War and invented the duplex signal disk and code now in general use in military operations. He had been connected with the company for about 40 years.

ELISHA M. MOORE, Syracuse, N. Y., died suddenly May 16. He was born in Schenectady February 5, 1835. When 17 years of age he became connected with a railroad company in the accounting department, and continued in the railroad business for over 25 years, ultimately becoming general freight and passenger agent of the Rome, Watertown & Ogdensburg Railroad. In June, 1888, having severed his railroad connection he joined the interests of the Howard Furnace Company of Rome, becoming president. He continued until the formation of the International Heater Company, composed of the Carton, Kernan and Russell-Wheeler furnace companies of Utica and the J. F. Pease and Howard companies of Syracuse. Upon the formation of the International Heater Company Mr. Moore was made manager of the Syracuse branch of the company, from which he retired some time ago. He is survived by his widow and one son, Frederick H. Moore, treasurer and secretary of the International Heater Company.

AMOS H. BRAINARD, founder of the Becker-Brainard Milling Machine Company, Hyde Park, Mass., died May 20, aged 81 years. He was in good health until the day before his death, when he contracted pneumonia and failed rapidly. He was born in Newburyport, Mass., March 27, 1824, and went to Boston when very young and removed to Hyde Park in 1858. He was the inventor of the Union vise, for the manufacture of which the Union Vise Company was formed in 1866, and continued business until the plant was burned in 1871, when the patent rights to the vise were sold to another company. Mr. Brainard then began the manufacture of milling machines, and built new works on the site of his old shop. He carried on the business for 30 years. About five years ago the business was consolidated with that of John Becker, of Fitchburg, the Becker-Brainard Company being formed with Mr. Brainard as the president. He remained with the company until he retired from business life. He was always active in the affairs of his town, serving nine years as Selectman and 26 years as a trustee of the public library. He was vice-president and a trustee of the Hyde Park Savings Bank, vice-president of the Hyde Park Historical Society and one of the founders of Christ Episcopal Church. He leaves a son and five daughters.

ALBERT H. VOGT, only son of Henry Vogt, president of the Henry Vogt Machine Company, Louisville, Ky., died May 12, aged 21 years, after an illness of three weeks. He was educated in Louisville schools, but before completing his course of education began to take an active interest in his father's business. A few months ago he was made director of the Henry Vogt Machine Company, in which he was a large stockholder. He was also one of the organizers of the Merchants' Ice Company.

PERSONAL.

Charles M. Schwab arrived in New York May 19 on his return from Russia. It is stated that he secured a contract for armor plate for Russian war ships amounting to about $1,000,000.

F. C. Smink, president of the Reading Iron Company, Reading, Pa., has made the following appointments: J. M. Callen, assistant to the general manager; G. F. D. Hallman, purchasing agent; E. J. Mishler, assistant sales manager of the tube works sales department.

David Thomas, recently with the Reading Iron Works and previously at Danville, Pa., has been appointed general manager of the Logan Iron & Steel Company, Burnham, Pa.

Charles H. Lay has been appointed secretary of the Manufacturers' Bureau of Hartford County, Hartford, Conn., and will have charge of the Labor Bureau conducted by the association.

J. H. Hamilton, who was until recently sales agent for the Dillon-Griswold Wire Company, Sterling, Ill., has been made manager at St. Louis of the Pittsburgh Steel Company, with offices in the Security Building.

J. G. White & Co., Incorporated, engineer and contractor, New York and London, announces that it has secured H. J. Slifer as steam railroad expert. Mr. Slifer has had an extensive railroad experience, and has for several years been general superintendent of the Chicago, Rock Island & Pacific Railroad, in charge of operation, motive power and maintenance between Chicago and Denver.

Wallace Buell has been appointed manager of sales of the Passaic Steel Company, with headquarters at the works, Paterson, N. J.

It is the intention of the Carnegie Steel Company to increase the capacity of the hoop and cotton tie mills at Greenville, Pa., at least 50 per cent. The equipment in the mills at Girard, Ohio, is being removed to the Greenville and Duquesne plants, and the finishing mills at the latter plant will be increased about 30 per cent. in capacity. The 7-inch mill formerly at Girard is being installed at Greenville and built along with the 8-inch mill now in that plant. Tandem rolls will be built and other improvements made.

THE IRON AGE

1855—1905.

New York, Thursday, May 25, 1905.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
CHARLES KIRCHHOFF, - - - - - - - - - EDITOR.
GEO. W. COPE, - - - - - - - - - - ASSOCIATE EDITOR.
RICHARD R. WILLIAMS, - - - - - - - - - HARDWARE EDITOR.

Don't Get Blue.

This is the season for all sorts of adverse developments which are calculated to confuse business men. It is the season when speculation is rampant in cereals, and the two forces of bulls and bears are actively endeavoring to secure advantages over each other. Rumors consequently are always rife at this time of serious damage to the growing crops, and sometimes they are so ingeniously put that the world is almost startled by the report of the total destruction of crops in one or more of its most important sections of supply.

We have had during the past ten days a succession of disturbing developments in addition to disquieting crop reports which have possibly had considerable influence in causing business men to be exceedingly cautious in making commitments for the future. The mere announcement that the production of pig iron in this country had at last caught up with the supply was seized upon by ingenious speculators and so exaggerated as to enable them to attack prices of securities. The fact was completely disregarded that the iron and steel works of the country are so well supplied with orders that no serious depression in trade is to be expected for several months at least. Then came the reports from Detroit that the Amalgamated Association would insist upon an advance in wages of 10 to 25 per cent., or thereabouts, in making up the wage scale for the coming year, beginning with July 1, and that, as the manufacturers would undoubtedly be unwilling to concede such a large advance, a strike was absolutely certain in the mills of the United States Steel Corporation and other large employers. This was again seized upon by speculators and again stocks suffered. The fact was not taken into consideration in this case that between now and July 1 the conferences will occur between the employers and representatives of the employees, and in all probability a settlement may be realized upon terms mutually satisfactory and any disagreement be avoided. Nor was the further fact considered that the Amalgamated Association controls the skilled labor in only a minority of the mills of the Steel Corporation and in only a minority of those outside. In any event, it will be a considerable time before even the possibility of a strike is to be considered as threatening. The attitude of the Isthmian Canal Commission with reference to the purchase of supplies was exploited as indicating an undoubted opening of the tariff question next winter, with its usual disagreeable effect on business. But next winter is a long way off and much can happen in the meantime to change the views of even the most strenuous men.

As all these influences have had their effect upon the values of securities, and securities have gone down, we have now apparently reached a point where the effect may resolve itself into a cause and the tumble in securities may be looked upon as the particular reason why business men should be conservative. Arguing from the slump which has taken place the past week, operators for a further fall in securities will claim that something serious is pending in financial circles and thus endeavor to bring about a panicky feeling to induce continued sacrifices of values by holders of securities. It is in such a time as this that business men need to turn their attention from what happens in the stock market to actual conditions throughout the country. They should take into consideration the special currents influencing their own trade and determine whether developments are more likely to be in the direction of improvement than of stagnation. We have undoubtedly reached the point in the year when a careful view of the situation should be taken, but we believe the conditions are not such as to cause any fear of actual adversity.

The English Pig Iron Warrant Market.

A brief London cablegram to the daily papers a few days since gave the conclusion to an interesting episode. For some considerable time an active speculation for higher prices has been in progress in the British exchanges dealing in warrants for Cleveland pig iron. It had its origin some months since, when the condition of the pig iron trade in this country was such as to cause the belief both here and abroad that consumers in this country would, before the subsidence of the activity in the iron trade, be obliged to turn to foreign markets for additional supplies. This belief was encouraged by the steady decline in stocks of pig iron in makers' hands in this country, also by the increasing disposition of our foundrymen to purchase foreign pig iron to secure the benefit of the drawback in making exportations of their finished products.

When the belief became quite fixed in the minds of dealers in Cleveland warrants that the iron trade of the northeast of England would be particularly benefited by an American demand, speculation became active in such warrants and prices began to rise. The trade in the meantime did not develop as expected, either here or in the natural markets for Cleveland pig iron, and as a result of the rise in prices the Cleveland pig iron makers began to put their iron in warrant stores to take advantage of the situation. The increase in stocks in the warrant stores did not for a time affect the price of warrants, which continued to advance under the belief that the American demand would certainly develop some time during the spring months and thus give the speculators an opportunity to unload it at a handsome profit. The price rose week by week until the quotations on Cleveland No. 3 warrants attained 54 shillings 6 pence, which was not only out of all proportion to prices of finished products in the British market, but also completely out of line with other classes of pig iron. Scotch warrants, for instance, which are ordinarily quoted about 8 shillings per ton above Cleveland warrants, were selling at 2 shillings 3 pence below. Middlesbrough hematite pig iron, which ordinarily sells at 10 shillings per ton above Cleveland warrants, was only commanding a price of 1 shilling higher. The condition became such that furnacemen found it was indeed very much better to put their product in the stores than to make any attempt to sell it in the open market.

This speculation continued until the stocks of Cleveland pig iron in the warrant stores rose to nearly 450,000 tons, as against a stock of only 85,000 tons at the corresponding time last year. This heavy increase in stocks, coupled with the announcement made this month that the supply of pig iron in this country had at last caught up with the demand, became too strong an adverse factor to enable the upward movement to be pushed any further and the market has therefore collapsed, as stated in the cable advices.

If a movement of such a character had been undertaken in this country it would have been most savagely criticised as interfering with the natural course of trade. It would have been assumed as a development to be expected in accordance with the speculative tendencies of the American mind and the American modern business man. But it has occurred in a country in which the traditions are strongly of a conservative character, and in which the members of the iron trade flatter themselves that they have not yielded to the allurements of speculation so much as in other sections of the world. Here, however, we see an important branch of the iron trade of Great Britain thrown completely out of line by a speculation induced through the hope of enrichment from the expansion of the American iron trade. This was but a slender peg on which to hang hopes of much profit. Even if this country had been compelled to purchase some pig iron to meet its requirements, it certainly would not have taken much. The equilibrium between supply and demand for several months has been seen to be pretty closely established. The speculators in Cleveland warrants have very properly come to grief. It is to be hoped that the result of their unfortunate movement will not have serious effects on the general British iron trade.

A Successful Arbitration.

Employees, as a rule, have a very erroneous impression of the earning powers of the establishment of which they are units. They fail to recognize more than two elements in estimating cost of production—namely, the cost of raw material and the cost of their own labor. The profits of a business figured on this basis must necessarily seem to be very large, but the basis is, of course, an entirely fictitious one. It does not reckon in the cost of administration, of depreciation, of insurance, power, lighting, water, repairs, advertising and so on. Consequently, when employees consider the question of the wages that the employer can afford to pay they will not believe what they are told as to the amount of profit that the business is actually earning. At the same time they fail to recognize what is generally a fact nowadays, that the officers of a corporation are not the real owners of the business, personally pocketing the profits, but that instead there may be a large number of shareholders, many of whom are dependent upon their dividends for their support, not a few of them being poor, comparatively speaking. Many individual stockholders of large corporations have smaller incomes than the employees themselves.

A recent instance brings home to the wage earners the actual conditions that exist in one great line of industry and affords one example of the occasionally beneficial results of arbitration. The cotton mill owners of Fall River, Mass., and their employees agreed to leave the matter of a demand for 5 per cent. increase in wages to Governor Douglas of Massachusetts, a business man himself, accustomed to deal with large affairs. It may be mentioned as bearing upon the case that the employees were confident that they would be given the benefit of any doubt that might exist, perhaps presuming upon the possibilities of the political future. The Governor has now made his report, after a careful investigation of the conditions of the business. He found that the margin between the cost of 8 pounds of cotton and 45 yards of cloth was slightly less than the 75 cents agreed upon as the basis upon which the increase would be made. Consequently the decision is against the increase in wages. In this calculation 6 per cent. was allowed for dividends and 5 per cent. for depreciation. It should be remembered that the long and terribly expensive Fall River strike hinged upon this demand for an increase, and the strike was closed upon the agreement for arbitration. Had arbitration been agreed upon in the first place the same result would probably have been reached, and both employer and employee would have been saved from serious loss, which in the case of the working people was in many instances actual privation. The city lost a great deal of money and its general business was seriously impaired. There are always fair minded men who would consider such a question with the same impartiality as did Governor Douglas. There are many differences between employer and employee that could be left to a referee without loss of dignity to either party. Employees do not realize the question of profits. If they could be taught the true inwardness of business a more reasonable view of the wage question would often result. The agitator tells a body of men that their employers are making fabulous profits and urges them to compel a sharing of the earnings which they assist in procuring. Labor is often fair when taken into the confidence of the employer, which can best be done at times through the medium of intelligent and just arbitration.

The Amalgamated Association Elects New Officers.

P. J. McArdle, Muncie, Ind., has been elected president of the Amalgamated Association of Iron, Steel and Tin Workers, succeeding Theodore J. Shaffer, and other officials were elected as follows: John Williams, Pittsburgh, secretary and treasurer; M. F. Tighe, Pittsburgh, assistant secretary; trustees, Elias Jenkins, Youngstown, Ohio; John G. Hagen, Piqua, Ohio, and C. J. Monahan, Pittsburgh. Five salaried vice-presidents were elected to fill these offices, recently created by the Amalgamated Association, as follows: For the Eastern district, F. J. Wright, Lancaster, Pa.; for the boiling trade, Thomas Williams, Vincennes, Ind.; for the finishing trade, Joseph W. Rutledge, New Albany, Ind.; for the sheet mill trade, Llewellyn Lewis, Martins Ferry, Ohio; for the tin trade, William Larkins, Martins Ferry, Ohio.

Cincinnati was chosen for the next convention. The convention reconsidered its action adopting a percentage plan for assessing dues and readopted the former graded plan. Under this plan the members earning up to $2 per day will pay 60 cents per month; from $2 to $4 per day, 80 cents per month, and from $4 per day upward, $1 per month.

Peter J. McArdle, elected president of the Amalgamated Association, has been a resident of Muncie for 11 years. He is 31 years of age and is the youngest president the association has ever had. He went to Muncie to accept a position as heater at the Indiana plant of the Republic Iron & Steel Company, where he has worked continuously since. For the past two years he has been vice-president of the Amalgamated Association for the Fifth District, with headquarters in Muncie.

The Myersdale Sheet Steel Company.—The new sheet plant of this company at Myersdale, Pa., on the main line of the Baltimore & Ohio Railroad has been completed and placed in active operation. The buildings are of steel construction, the main building being 150 feet long and 55 feet wide, with an adjoining structure 25 feet wide and of equal length. The plant contains two hot mills and one cold mill, also two heating furnaces and one annealing furnace. Motive power is furnished by a 60 x 80 Corliss engine and one high speed Beck electric engine. Three 150 horse-power Phœnix boilers have also been installed. The output is between 20 and 30 tons a day of 16 to 30 gauge black sheets. The officials are: C. M. Truxall, president; A. F. Baumgarten, vice-president; E. M. Beachley, secretary, and Eugene Floto, treasurer. The general offices are at Myersdale, while A. F. Baumgarten & Brother, Farmers Bank Building, Pittsburgh, are sales agents.

The National Association of Manufacturers.

Tenth Annual Convention.

ATLANTA, GA., May 18, 1905.—One of the most successful and notable gatherings in the history of the organization was the tenth annual convention of the National Association of Manufacturers, held in this city May 16, 17 and 18. Manufacturers from almost every section of the country were in attendance, and the enthusiasm and interest which prevailed were most satisfactory. The papers which were read before the convention and the different matters of importance to the members of the association were received with careful attention.

The first day's proceedings of the convention, which were given in the last issue of *The Iron Age*, were followed by a two days' programme of equal interest.

At the Tuesday session of the convention Eugene N. Foss of Massachusetts spoke on "Reciprocity." He contended that our foreign trade would be ruined unless we adopted a policy of reciprocity and favored a revision of the tariff on certain articles. His address was received with hearty applause.

A resolution was adopted reaffirming adherence to the open shop policy. The resolution urged all manufacturers who have not adopted the open shop to do so, and to give the youth of America the same privilege to earn their bread as was accorded the pioneers of this country.

Speech of Samuel Spencer.

The speech of Samuel Spencer, president of the Southern Railway Company, on "Rate Regulation," was full of interest. In discussing this question, Mr. Spencer said:

> The remedy for corporate evils lies not in suppression nor in undue Governmental regulation nor in Governmental control. Suppression by statute has been tried, and has failed. Governmental regulation beyond the limits of correcting irregularities and abuses means a paternalism which will not only sap the energies and initiative of the country, but may possibly threaten the foundations upon which free government is based.
>
> The remedy lies in an intelligent and thorough recognition of the benefits to be derived from large corporate instead of small individual activity; it lies in throwing the searchlight of public knowledge and public scrutiny upon all corporate action and methods which can, by illegal abuses and discriminations, inflict injury and injustice upon others of equal rights; it lies in wise and judicious laws in respect to the formation of corporations, the amount and character of their capitalization and the scope of their corporate powers, and in a system of Governmental supervision and inspection which can successfully detect and punish all infractions of the law.
>
> It lies not in the restriction of the earning power or the profits of corporations thus formed or thus supervised. The profits of corporations, legitimately organized and legally and honestly conducted, should be no more restricted by Governmental action than the profits of the individual engaged in similar pursuits.

Committee Reports.

The Committee on Interstate Commerce submitted the following resolution, which was adopted:

> *Resolved*, That we favor the active enforcement by the executive department of the general Government of all existing laws to prevent the giving or acceptance of rebates or special favors (through whatever device) to or by favored shippers, and we call upon the Interstate Commerce Commission to apply all the remedies at their disposal, as provided by the original Interstate Commerce act and the Elkins act amending the same.
>
> *Resolved*, That if the existing laws for the detection and punishment of the giving or acceptance of such rebates are insufficient or defective in any respect, we favor the enactment of such further legislation as may be necessary adequately to deal with the evil and to secure its complete prevention.
>
> *Resolved*, That in order to carry into effect the provisions of the foregoing resolutions Congress be asked that a provision be made for the necessary examination of the books of the railroad corporations, something after the manner of the national bank examinations, for the purpose of detecting and eliminating special favors and discriminations against the small or less favored shippers, and also that provisions for adequate punishment be provided for improper disclosure of confidential information so gained.

The Committee on Patents made their report, which was in part as follows:

> It is with regret we report the failure of the bills looking to the establishment of a Court of Patent Appeals. The need of such a court is becoming greater and more apparent with the increase in the extent and value of the interests dependent on patents. Under the existing law there is no right of appeal in any patent case to the Supreme Court of the United States. Each Federal Circuit is a law unto itself. The appeal can only be taken to the Circuit Court of Appeals in each circuit. As between the different circuits there may be and is the widest diversity of opinion on many questions of law. There is at present no tribunal from which the owner of a patent may secure a decision co-extensive in effect with the territory covered by the patent. A patent sustained in one circuit may be defeated in another. A defendant held to be an infringer in one circuit may be held to be a noninfringer in the adjoining circuit. This condition of affairs leads to great uncertainty as to the rights of the owners of patents and as to the rights of the public. It leads to a multiplicity of actions and to great and needless expense, and jeopardizes the interests of all concerned. It is of vital importance that the right of appeal to the Supreme Court of the United States be re-established, or that a Court of Patent Appeals, having jurisdiction throughout the United States, be established, with the right of appeal thereto from all the circuits.

The report on strike insurance, which was adopted by the convention, was in part as follows:

> About three-fourths of our membership appear not sufficiently interested in the matter to reply to our circulars. We learn that about one-half of our membership failed in like manner to reply to the circular sent out by the Fire Insurance Committee. It seems, therefore, that the idea of utilizing the collective power of the association in such matters does not as yet appeal strongly to the majority, though twice as many members are interested in fire insurance as in strike insurance.
>
> In view of the limited number of members desiring insurance, your committee do not recommend to the National Association of Manufacturers at the present time the creation of a Strike Insurance Bureau. We do recommend, however, that the committee be continued for another year, and that we be instructed to obtain permission of the individual members who have indicated a desire for strike insurance to use their correspondence for the purpose of securing the most favorable competitive propositions obtainable from responsible insurers, thereby furthering the actual writing of strike insurance. We make this recommendation in the conviction that the spread of strike insurance must necessarily benefit not only the insured but the entire community.

A feature of the convention was the interesting report of Anthony Ittner of the Committee on Industrial Education. The report stated that 80 per cent. of pupils in public schools drop out before reaching the high school, and 97 per cent. fail to graduate in high schools. The report laid especial stress upon the necessity of educating the young, and bitterly condemned the Federation of Labor for placing obstructions in the way of education. The report upon this part of the subject stated: "Formerly the apprenticeship system offered to the American boy the opportunity to learn a trade, but to-day the changing industrial conditions, and the bitter and cruel opposition of organized labor as a whole, have nearly destroyed this former safeguard of opportunity." The report goes exhaustively into the subject of technical education.

A masterly paper on "Fire Insurance," by Edward Atkinson of Boston, was read by Secretary Cushing, as Mr. Atkinson was unable to attend.

At the final session an address was made by George J. Seabury of New York, who spoke on "Tariff Revision and Remedy." The speaker favored a revision of the tariff and gave many facts and figures.

The report on national incorporation of the association was then made, which concludes as follows:

> We doubt if there is any panacea by which the monopolistic spirit and practice shall be put down or cast out altogether or by which inequality of treatment under the laws and in the administration of justice may be done away with.
>
> We simply recommend to all a fearless and persistent agitation of these great industrial subjects, so that the truth, or something as near to it as possible, may be known. And we also recommend that, while everything possible should be done to cause those who would take unfair advantage of our laws, or of their administration, or of conditions now existing, to desist under the scorn of public opinion, we ought all to await developments and watch them closely at the national capital and in the different States not only to see what has been

proposed that does not stand the test of public and private efficiency, but to support remedial measures wherever possible, no matter if they seem to be of little consequence, where they are admitted to be in harmony with the spirit of our institutions—fair play for all.

The Committee on Resolutions offered the following resolution in regard to the eight-hour law and other restrictive legislation, which was adopted:

The association declares its unalterable antagonism, from the standpoint of free and successful labor and of progress for the individual workman and capitalist in the country dedicated to progress, to compulsory and restrictive legislative propositions of any kind calculated to distinguish class from class, to interfere with the free and lawful conduct of industry and to prevent the employer from employing and the worker from working; and it pledges anew its earnest educational and moral support of those administrators and legislators who see their duty and then do it, and to a learned and patriotic judiciary which upholds the law all the more sternly in spite of unworthy and temporary popular clamor.

A resolution was adopted protesting against the passage of an anti-injunction bill, as follows:

Therefore, be it resolved, by the National Association of Manufacturers, that we declare our uncompromising opposition to any and all anti-injunction bills, of whatever kind, or any proposition, whether made by organized labor or its apologists, to deprive the people of that protection to which they are entitled, for their property and their lives, under the beneficent provisions of the law, and we call upon all good citizens, whether working with hands or brains, and whether possessed of little or much, to join with us in preventing, by all proper means, even the suggestion, in itself so great an insult to the working people themselves, of the smallest suspicion of partiality in the administration of our laws.

At the final business session Thursday morning the new officers were elected for the ensuing year, as follows: President, David M. Parry, Indianapolis, Ind.; treasurer, F. H. Stillman, New York; secretary, Marshall Cushing, New York. Vice-presidents: Alabama, George B. McCormick, Birmingham; California, H. D. Morton, San Francisco; Connecticut, A. B. Bullard, Bridgeport; Delaware, A. H. Hoffeker, Georgetown; Georgia, David Woodward, Atlanta; Illinois, Elliot Durand, Chicago; Indiana, E. H. Dean, Indianapolis; Kentucky, F. C. Nunemacher, Louisville; Louisiana, R. J. Wood, New Orleans; Massachusetts, George C. Draper, Hopedale; Michigan, B. T. Skinner, Battle Creek; Missouri, J. W. Van Cleave, St. Louis; New Hampshire, E. H. Pike, Pike; New Jersey, J. A. Jenkinson, Newark; New York, Ludwig Nissen, New York; North Carolina, D. A. Tompkins, Charlotte; Ohio, John Kirby, Jr., Dayton; Pennsylvania, D. E. Ripley, Pittsburgh; Rhode Island, Patrick E. Hayes, Union; Tennessee, H. S. Chamberlain, Chattanooga; Wisconsin, H. S. Smith, Detroit; Iowa, G. R. Easterbrook.

The next convention will be held in New York, which was decided on after a sharp struggle between that city and San Francisco.

The speech of Victor H. Metcalf, secretary of the Department of Labor and Commerce, on Thursday night was a fitting termination for the convention. In the opening remarks of his address Secretary Metcalf called attention to the fact that European manufacturers are gaining control of the markets that belong to Americans. "The time is ripe," said he, "for the invasion of foreign markets, especially the markets of the Pacific, and it will be your own fault if you do not at once start an aggressive and determined campaign for the purpose of securing these markets."

While the delegates were in this city an enjoyable social programme was carried out in their honor, ending with an old fashioned Georgia barbecue.

The Cincinnati Metal Trades Association held its annual meeting last week and elected the following officers for the ensuing year: President, P. G. March; vice-president, J. C. Hobart; secretary, William Greaves; treasurer, G. H. Broxterman. The subject of merging the local association into the national body came up and was discussed at length. Those present seemed to favor the scheme and there seems to be but little doubt that it will be done in the very near future. Commissioner W. P. Eagan is confined to his home in Chicago with a severe attack of rheumatism.

Steel Rails for Fast Lines.

Practice of Railroads in Leading European Countries.

WASHINGTON, D. C., May 20, 1905.—An interesting paper on the types of steel rails for lines with fast trains in use in the leading countries of Europe was presented during the closing sessions of the International Railway Congress, just concluded at Washington, by Mr. Van Bogaert, chief engineer and director of the Belgian State Railway. The method of manufacture, the experimental use of nickel alloys, the shape and weight of the rails were discussed in detail, and conclusions, based upon very comprehensive data obtained from the managements of the leading railway systems of the world, were embraced in the report, of which the following is an abstract:

Data from Thirty Roads.

The reports of 30 railroad managements in England, Australia, Austria-Hungary, Belgium, France, British India and Italy were employed as the basis of this paper. These managements use two kinds of rails. Bull headed rails are used by the English company, by three French companies and by two companies in British India. Symmetrical double headed rails are used only by the French Midi Railway. The other railroads on the Continent of Europe, the Australian railroads, two railroads in British India and one Irish railroad use Vignoles rails. The rails are supported on wooden transverse sleepers, and in the case of two Indian railways on cast iron pot sleepers with iron tie bars. No railroad uses metal sleepers, and where they had been put in as an experiment, with rails weighing 38 kg. per meter (76.60 pounds per yard)—Belgian State Railway—the results were so unsatisfactory that they had to be taken out after they had been in use only a few years. They had been put in on certain lines over which more than 100 heavy trains (weight hauled 300 to 600 tons) ran per day. The greatest objection to these sleepers was that the ballast, which consisted of broken porphyry, became crushed; they drew up the water from the subsoil into this crushed ballast and made it muddy; under the sleeper a sort of macadam was formed which it was impossible to pack properly. These lines were abominable. Moreover, cracks started from the holes provided for the fastenings. It might be possible to avoid the drawing up of the water by carefully draining the subsoil and to prevent the cracks by drilling out the holes, but it is not seen how the crushing of the ballast could be prevented. In Germany there are heavy lines with fast traffic which have metal sleepers; they seem to give better results, but ballast of broken basalt is used, which is probably harder than ballast of broken porphyry.

Weight of Rails.

Everywhere on lines with fast trains a tendency to increase the weight of rails is observed. It is, however, worth mentioning that some railroads still have rails weighing 30 kg. per meter (60.48 pounds per yard) in use on such lines. Thus the French Northern Railway will only have removed the last in 1905. These rails, which are 8 meters (26 feet 3 inches) long, and are supported on 11 or 12 sleepers, may even have their heads worn to a certain extent and still be sufficiently safe. It is true that the heaviest wheel load on that line amounts to only 8.1 metric tons (7 tons 19 cwt. 2 qrs.), and that the fast and heavy trains are hauled by four-cylinder compounds, acting two and two on two driving axles.

These powerful and well balanced engines are very stable, even at speeds of 120 km. (74.6 miles) per hour, and impart very little irregular movement to the vehicles hauled. The destructive action of the rolling loads on the track is thus reduced to a minimum, in spite of the great tonnage and great speed of the trains.

The web is, as a rule, inclined about 1 in 20, so that a new tire is in contact with the middle of the rolling surface of the crown. Only two Australian railroads and the Belgian State Railway set the rails so that the webs are vertical; this is also the general practice in the United States of America. This is no serious disadvantage as far as the wear of the crown is concerned, but we think that this practice leads to abnormal wear of the

tread of the tire near the flange during the years which elapse until the rolling surface becomes worn down to an inclined plane. Moreover, when a wheel runs over a rail the rail is canted, and as a consequence the inside fish plate has to support the greater part of the stress due to the bending at the fish joint; if the joints are suspended joints with weak fish plates, those on the inside become broken in a few years (outside fish plates very seldom break). In America, where the rails are also set with the web vertical, fish plates break equally frequently; such fractures do not occur so frequently with the rails inclined, and on such there is probably no difference between the numbers of fish plates broken inside and outside. We only see disadvantages and no advantages in setting the rails with the web vertical.

It is useless to give too much thickness to the head. With rails which have a strong cross section and are made of hard and tough steel the wear does not amount to 1 mm. (0.04 inch) per 100,000 or 120,000 trains. On busy lines with fast traffic where the weight of the trains and the wheel loads are not excessive (and this applies to all the railroads which we are considering), it is enough to have as minimum 35 mm. (1⅜ inch) at the thinnest part. The rails on a line in the open will then not require to be taken out on account of the wear of the head till after 50 years.

Process of Manufacture.

On the Continent there is a tendency to change the process of manufacture of steel for rails; formerly scarcely anything but acid Bessemer was used, but to make this, cast iron manufactured out of ore free from phosphorus was required. Such ore being scarce, most of the steel works have been led to adopt the Thomas or basic Bessemer process. Exceptionally there are also steel works where rails are made out of Martin or Martin acid steel.

The managements that used Thomas steel ten years ago have had plenty to complain about; metallurgists till then did not understand the process properly. It was thought that any pig iron, of any composition, was suitable for making Thomas steel, and the results obtained were poor. But subsequently we think that the Thomas steel manufactured for rails was just as good as the Bessemer, and most engineers seem no longer to have any objection to Thomas steel. If, however, we are to believe in certain statistics, the general use in Germany of Thomas steel is the cause of the more numerous rail fractures which occur there as compared with England. Now, in the first place, is it true that in Germany there are more Thomas rails than Bessemer rails in actual use? Moreover, there is nothing conclusive about these comparative statistics applying to two countries where the climate, the working, the traction, the cross section and the dimensions of the rails, their method of manufacture and the railroad system are so entirely different. Any comparison of fractures can only be made between rails of the same cross section on lines of the same age and carrying the same amount of traffic. The North Eastern in England uses both Bessemer and Thomas rails, and the latter do not break more frequently than the former.

The Belgian State Railway system has 11,230 km. (6978 miles) of rails on main lines, of which 1400 km. (870 miles) are 52 kg. (104.83 pounds per yard) rails laid between 1888 and 1894; and 1800 km. (1118 miles) are 40.6 kg. (81.84 pounds per yard) rails laid between 1900 and 1903. During 1903 there were recorded 401 transverse fractures of 38 kg. (76.60 pounds per yard) rails, or of rails of old sections, 9 of 52 kg. (104.83 pounds per yard) rails, and 5 of 40.6 kg. (81.84 pounds per yard) rails. The annual traffic amounts to 60,000,000 train kilometers (37,283,000 train miles). The 38 and the 52 kg. (76.60 and 104.83 pounds per yard) rails are of Bessemer steel. Of the former, there are some more than 30 years old (1872), and the oldest break the most; of the 40.6 kg. (81.84 pounds per yard) rails two-thirds are made of Thomas steel and one-third of Bessemer.

Superiority of Heavy Rails.

According to these statistics, in Belgium, on a system of about 4000 kg. (2483 miles), about one rail is broken per year per 10 km. (6.2 miles) of railway, whereas in England only one rail is broken per year per 100 km. (62.1 miles) of railroad (in Germany one rail per 4 km. [2.5 miles] of railroad). Bessemer rails, however, are used in both cases, and the cause is not Thomas steel. The favorable influence of heavy rails is also clearly shown, for it must be noted that there is most traffic on the lines with 52 kg. (104.83 pounds per yard) rails. In order to reduce the number of fractures of rails it would perhaps be advisable, taking the lightness of the 38 kg. (76.60 pounds per yard) rails as compared with the heaviness of the rolling loads into consideration, to limit the time the 38 kg. rails are left in on main lines to a greater extent than is at present the case.

According to Haarmann, 41 kg. (82.63 pounds per yard) Thomas rails, put in on the Cologne-Hamburg line, near Osnabruck, in 1901, at the same time as the Bessemer rails, show about twice as much wear as the Bessemer rails. We have already seen that the Bessemer rails of that line show twice to three times as much wear as those of the French Northern. The Thomas rails show a wear of 1 mm. (0.04 inch) per 25,000 trains; but although the chemical composition and the physical qualities of the Bessemer steel are given, we do not find those of the Thomas rails; they are probably made of soft steel or else rolled at too high a temperature.

Chemical Composition.

In order to obtain tough and hard rails most suitable for resisting wear and tear the chemical composition, in percentages, should be somewhere about as follows: Silicon, 0.1 or less; manganese, 1 to 1.2; carbon, 0.5; phosphorus and sulphur, less than 0.1. Haarmann proposes the same proportion of carbon as of silicon, from 0.2 to 0.5. (The English specifications place silicon on the same footing as phosphorus; not to exceed 0.1.) We have seen before that the rails with 0.2 to 0.5 of silicon on the line from Cologne to Hamburg became worn more quickly than rails of the same hardness on the French Northern. It is probably the bed plate which is one of the causes of the greater wear of the German rails, but in any case it is by no means proved that the great proportion of silicon beyond 0.1 reduces the wear.

Ferrosilicon is added in a small proportion to steel in order to prevent blow holes. Aluminum in the state of metal is also used successfully, but it is still rather expensive. Similar results are obtained with ferro-aluminum. It is also recommended to stir up fused metal before casting it; these are details for steel manufacturers to consider.

Many of the railroads are satisfied with drop tests and examining the fractures; they must show a fine grain. Others specify the steel by its ultimate tensile strength and elongation. There is a general consensus of opinion that the ultimate tensile strength of steel for rails should average 70 kg. per square millimeter (44.45 tons per square inch) and should not be less than 65 kg. per square millimeter (41.27 tons per square inch); the elongation should be at least 10 per cent. When this is specified the steel works (Bessemer as well as Thomas) generally supply rails having an ultimate tensile strength of between 68 and 72 kg. per square millimeter (between 43.18 and 45.72 tons per square inch) and an elongation of from not less than 12 up to 17 per cent. In England, as a rule, an elongation of 15 per cent. is specified.

Nickel Alloys.

No railroad has given any information about nickel steel rails. On the tracks subjected to most wear and tear heavy rails of good steel, on the open track, wear to the maximum extent of 20 square millimeters (0.34 square inch) per year; this makes a loss per meter of $\frac{20 \times 1000 \times 8}{1{,}000{,}000} = 1.6$ kg. (0.34 pound per yard). A very heavy rail thus can stand the wear on the head for about 50 years. It is useless to extend this period by increasing the original capital outlay materially; this would be a very unprofitable financial operation.

We therefore do not think that it is advisable to use nickel steel on our tracks here in Europe, even exceptionally, as long as such steel costs materially more than

ordinary steel. The first application, if the price of the nickel came down, would be for special appliances, crossings, frogs; in such case also hard and tough steel seems to be good enough, at least under the present conditions of working.

Summary and Conclusions.

Experience seems to prove that neither metal sleepers nor longitudinal sleepers are suitable for busy lines with fast traffic The weight of rails tends to increase with the speed. Heavy rails have certain advantages over light rails; the track requires less maintenance and fewer renewals, the rails get worn less and break less. With excellent rolling stock and well balanced locomotives the necessity of using heavy rails is not so paramount. Putting in the rails so that the web is vertical has more disadvantages than advantages. It would be desirable to have a wider head and to have a flat, rolling surface like the tire, so as to prevent the hollowing out of the latter by the mutual action of the two bodies in contact. The minimum thickness of the head can be reduced to 3.5 cm. (1⅜ inches). By widening the head the surfaces on which the fish plates can bear are increased; this reduces the excessive wear of the rail and fish plate surfaces in contact with each other, and consequently the deformation of the joint. For this same reason, the steel used for fish plates should be as hard as that used for the rails, contrary to the usual but erroneous practice. It may be possible to do away with metal bed plates (which appear to make the running less smooth) by using oak or beech sleepers.

The manufacture of Thomas steel rails has made considerable progress during the last few years. These rails resist wear as well and do not break more frequently than rails manufactured by other processes. The rails must be rolled at a low temperature (850 degrees C. [1562 degrees F.]) Rails rolled at a too high temperature, with a coarse crystallization, can be improved by reheating to a suitable temperature. In order to have steel of good quality it is desirable in the case of Vignoles rails to roll sections with flanges thick at the edges (at least 13 mm. [33-64 inch]). Specifications laying down that part of the ingot, bloom or rolled bar that is to be cut off should not specify the exact amount to be cut off; the better the manufacture the less the liquidation and piping is there and the less need to be cut off. The chemical composition in percentages of rails should be about: Silicon, 0.1; manganese, 1 to 1.2; carbon, 0.5; sulphur and phosphorus, less than 0.1. Is it true that the resistance to wear is increased by increasing the proportion of silicon to 0.5 per cent.?

Steel having an ultimate tensile strength of at least 65 and even of 70 kg. per square millimeter (41.27 and even of 44.45 tons per square inch) and an elongation of 10 per cent. is to be preferred for rails; for special track appliances it is advisable to use even harder steel. Steel for the tires of locomotives and express rolling stock must be hard and tough; it should have an ultimate tensile strength of at least 70 kg. per square millimeter (44.45 tons per square inch) and an elongation of 15 to 20 per cent.

Nickel steel is not used for rails and it is unnecessary to try it for European traffic; heavy rails of hard steel, rolled at a sufficiently low temperature, seem to be more economical even at places where there is an abnormal amount of wear and tear. Nickel steel might be tried for tires. Several systems of supported and suspended rail joints are being tried, but sufficient time has not yet elapsed to make it possible to draw any conclusions.

Reducing the width of the expansion gap in the case of heavy long rails should be tried. Broken joints (in the case of 18 meter [59 feet] or longer rails) seem to be preferable to joints opposite to one another. Welded joints are not to be recommended. It is desirable to have long rails; 18 meters (59 feet) is now a usual length; perhaps it would be possible to go to 24 meters (78 feet 9 inches) if there were no difficulties of transport. Would it not be possible to make trials of tight joints without expansion gaps over long distances, which would fulfill the same functions as welded joints? Creeping is counteracted without difficulty. W. L. C.

NEWS OF THE WORKS.

Iron and Steel.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, is preparing plans for some material additions to its plant aside from the building of a new Bessemer steel plant. The plant will shut down on June 30 for usual inventory, but will be idle only a short time.

The Western Tinplate & Sheet Company has been incorporated at Greencastle, Ind., with $300,000 capital stock, by John E. Carnahan, Edward A. Langenbach and Wm. M. Blecker. This is the successor of the Juniata Steel Company. The plant is being rapidly overhauled and newly equipped for early operation.

A structural steel plant is to be erected in Newark, N. J., within a few months by the New Jersey Iron & Steel Corporation, which was recently incorporated with a capital stock of $2,000,000. F. Augustine Thomas of F. A. Thomas & Co., bankers, 738 Broad street, Newark, is interested in the company.

Bids are being asked by the Colorado State Reformatory, Buena Vista, Col., on the following iron materials: 400 flat iron bars and 980 round iron bars of various sizes, 115 pounds different sizes of blank nuts, 40 cast iron washers, 30 cast iron bearing plates, 30 cast iron columns, 32 10-inch steel I-beams. Bids close June 5. A. C. Dutcher is warden.

It is probable the Morgan Construction Company, Worcester, Mass., which is considering the purchase of the Youngstown Bolt Company, at Youngstown, Ohio, will furnish the blooming mill, billet and sheet bar mills and other smaller finishing mills for the new Bessemer plant to be built by the Youngstown Sheet & Tube Company, at Youngstown, Ohio.

A slip has occurred at No. 4 Ohio furnace of the Carnegie Steel Company at Youngstown, Ohio, and the stack will be idle for a week or more. No. 3 furnace at this plant is also idle undergoing repairs.

Mary Furnace of the Ohio Iron & Steel Company, at Lowellville, Ohio, has been blown out for relining and repairs, which will take from a month to six weeks to complete. A new blowing engine is to be installed and a new casting house erected.

The last act in the receivership of the Carpenter Steel Company, New York, whose plant is located at Reading, Pa., was completed last week, and the reorganized company is now in possession of the plant.

The Lackawanna Steel Company, Buffalo, has been awarded the contract for furnishing 30 miles of steel rails for the new Keewenaw Central Railroad, now in course of construction in the Keewenaw County iron district, upper peninsula of Michigan.

General Machinery.

Mackintosh, Hemphill & Co., Pittsburgh, builders of engines and heavy rolling mill machinery, have received a contract for a large shear to cut hot steel slabs 8 x 36 or 6 x 48 inches, which will be used in connection with the new universal mill now being installed in the McKeesport works of the National Tube Company, at McKeesport, Pa.; three pairs of twin cylinder direct connected engines for the Latrobe Steel Company, at Latrobe, Pa., the order having been received through Julian Kennedy, consulting engineer; a 40 x 60 inch automatic engine for the Morgan Engineering Company, Alliance, Ohio, to drive the rod mills now being built by this concern for shipment to Japan; a 44 x 60 inch Corliss engine, similar to a number already built by this concern, for the Oliver Iron & Steel Company of Pittsburgh; also a contract for remodeling No 1 rail mill of the Lackawanna Steel Company, at Buffalo, N. Y., and an order for remodeling the heavy sheet mills of the Portsmouth Steel Company, Portsmouth, Ohio.

The Heppenstall Forge & Knife Company, Pittsburgh, has completed and placed in operation a new forge contained in a steel building, 60 x 220 feet, in which has been installed some new equipment, among which are several new hammers from 4000 to 10,000 pounds capacity. The machinery throughout this plant is now motor driven, power being furnished from its own power plant. In 1904 the company doubled the capacity of its knife and shear departments, and with the additional space provided by using the old forge for the manufacture of knives and shears it will be able to still further enlarge the capacity of this department. The generators in the power house are driven by Westinghouse engines.

The Dodge Mfg. Company, Mishawaka, Ind., secured the contract for machinery, rope transmission system and other equipment for the Lake Charles Ice, Lighting & Waterworks Company, Lake Charles, La.

The Sandusky Foundry & Machine Company, Sandusky, Ohio, is building a small addition to its machine shop to provide additional office and erecting floor space. Aside from a small hand traveling crane the new machinery required, consisting of some special drill presses, has been purchased. The company's business is constantly increasing, and it is likely that within a year or so a much larger shop will be required.

The machine shop of the Kilburn-Lincoln Company, Fall River, Mass., was damaged by fire May 16, the loss being about $20,000. The foundry was not damaged, as stated in the daily

press. It was found necessary to purchase new tools to replace those damaged by fire. No other machinery is needed.

The East St. Louis Locomotive & Machine Shop Company, East St. Louis, Ill., has increased its capital stock from $30,000 to $100,000. M. M. Stephens is president and Henry D. Cleveland secretary.

The Bantam Anti-Friction Mfg. Company, Bantam, Conn., recently incorporated, has purchased the plant and business from the receiver of the old Bantam Mfg. Company, and will continue the manufacture of roller and ball bearings for all kinds of machinery. All of the employees of the company are stockholders. The company has started out with more business than it can handle, and is adding to its present equipment new machinery in the way of punches, cutting off machines, screws, machines, &c. W. S. Rogers, who has been in the ball and roller bearing business for a number of years, is president; Frank W. Humphreys, cashier of the First National Bank of Litchfield, vice-president; Nellie M. Scott, secretary and treasurer; E. J. Martin, superintendent.

The new shop which will be built by the Wittington & Cooley Company, Jackson, Mich., to replace the building recently destroyed by fire, will be 104 x 218 feet.

The Richard Eccles Company, Auburn, N. Y., has been incorporated with a capital of $100,000 to manufacture carriage and wagon forgings and special drop forgings. The business was established by Richard Eccles in 1880, and Richard Eccles is president; Andrew H. Johnson, secretary, and William W. Eccles, treasurer.

E. C. Thurston, Gorham, N. H., needs a 7½ horse-power electric motor for use in a new builders' finish shop which he is building in that town.

Power Plant Equipment.

The W. K. Thomas Company, Baltimore, Md., has incorporated to manufacture diaphragm pumps for water circulation in gas and gasoline engines, carburators, friction clutches for propeller shafts and several other novelties in connection with automobile and yacht equipment. The company's work is at present being done by outside parties, but it has now secured estimates to remodel its premises to increase salesroom facilities and will soon install its own shop. The plant will be operated by electric motors which will be installed by the company itself. Machinery has all been arranged for. W. K. Thomas is president and treasurer, and E. D. Loame, Jr., vice-president and secretary.

According to the present plans, the new electric light plant which will be established at Bloomfield, Ind., will be of about 500 horse-power capacity. F. W. Shryer, secretary of the Bloomfield Mfg. Company, is at the head of the enterprise.

The Lake Shore & Michigan Southern Railroad Company is asking for bids for the rebuilding of its water works system at Elkhart, Ind.; estimated cost $20,000. Also for the installing of two new pumps of 1,500,000 gallons capacity, to be driven by electric motor.

The Lambert Gas Engine Company, Anderson, Ind., has prepared plans for an extensive addition to its plant.

Bids close June 5, at Belding, Mich., for building a new water works system and furnishing equipment to consist of the following: Two 1,000,000-gallon pumping engines, one 100,000-gallon elevated water tower, two 100 horse-power boilers. Bids are also asked on 1140 tons of cast iron pipe ranging from 4 to 12 inches, special castings, hydrants, valves, &c. Wm. E. Fisher is city clerk.

The city of Moorhead, Minn., awarded contract to the Westinghouse Machine Company for a Parsons turbine, generator, condensing apparatus, switchboard, &c., to be erected complete in the city electric light plant. The contract amounts to $18,750.

C. H. Brooks, Waterford, Conn., is to build a three-story grain mill, 40 x 70 feet, and will need a 40 horse-power steam plant.

The Estle & O'Brien Company, Portland, Maine, has established a boiler business on a small scale, and will do a general boiler repair business as well as that of makers of boilers.

The Big Four Railroad Company contemplates installing a water pumping plant at Bellefontaine, Ohio, to furnish water for the shops there.

The Indiana Hydraulic Company, Frankfort, Ind., has selected as the site for its proposed plant the mouth of Sugar Creek, about 20 miles north of Terre Haute. It is estimated that the minimum horse-power will be 1000; the maximum 1800 to 2000.

E. R. & W. H. Sponsler will install at Middletown, N. Y., one 225-kw. and one 350-kw. Bullock railway generators. These are intended to supply power for the existing lines of the Middletown-Goshen Railway Company, together with its extensions, the whole of which will hereafter be known as the Walkill Transit Company. Frank G. Brown is the local engineer in charge of the plant.

The Allis-Chalmers Company has received an order from the American Steel & Wire Company for its American Works at Cleveland, Ohio, for a 6,000,000-gallon pumping engine.

The Stayman Mfg. Company has been organized with a capital of $250,000 to engage in the manufacture of engines, steam valves, piston valves, vibrating piston rods and other steam appliances. The company will for a time have its output made at the factory of the Cockburn Barrow & Machine Company, Jersey City, N. J. The New York offices of the new company are at 143 Liberty street, and C. A. Weymouth is the president; George M. Clarke, secretary; J. L. De Saulles, treasurer, and David F. Stayman, supervising engineer.

The Kewanna Water Company has been organized at Kewanna, Ind., with a capital stock of $15,000, to construct and operate a water works plant. Dr. A. Armstrong is president.

The Lower Niagara River Power & Water Supply Company, Lewiston, N. Y., has increased its capital stock from $700,000 to $2,000,000. The directors of this company are George E. Greene, George W. Knox, James Lowe, James S. Simmons, Jno. F. Lynch, M. P. Hatch and F. J. Brown.

The National Furnace Appliance Company, Columbus, Ohio, has been organized with L. P. Zimmerman as president; E. S. Baldwin, vice-president; M. S. Seibert, secretary and treasurer, and C. F. Tinkham, superintendent. The company has its plant entirely equipped ready for business and is manufacturing the Tinkham hydro-carbon furnace to be placed in boiler plants for the promotion of combustion and saving of fuel. The company is incorporated under the Ohio laws for $25,000.

Metcalfe & Miller, Quincy, Pa., are having constructed an addition to their plant to increase their output of the Miller new model gasoline and gas engines, the Metcalfe air compressors and triplex water pumps.

Foundries.

The American Steel Foundries, 42 Broadway, New York, has received an order from the Great Northern Railroad Company for 1000 truck bolsters, to be applied to box cars to be built at the Pressed Steel Car Company's Works, McKee's Rocks, Pa.

The Velte Foundry & Machine Company, Pittsburgh, iron founders and machinists, will add a 10-ton furnace to its plant for the manufacture of steel castings, the concern intending to make this line of product in the future in addition to its regular lines of work.

The Empire Foundry Company, New Brunswick, N. J., is making some improvements to its plant, which covers 3 acres of ground. In addition to a general foundry business the company has branched out into the gas stove business, making and building gas ranges, cookers and hot plates. A nickel plating plant has recently been installed and a two-story brick building for offices and storeroom is being constructed, besides several frame buildings. The company is sending out a list of the different classes of gray iron castings which it makes.

The new plant of the Sheffield Cast Iron Pipe & Foundry Company, Sheffield, Ala., will be erected on a 30-acre site and will consist of a pipe foundry with a capacity of 200 tons per day, general foundry, machine shop, pattern shop and office building. The pipe foundry building will be 70 x 600 feet. John Thomson is general manager.

The Montford Machine Casting Company, Baltimore, Md., contemplates the erection of an addition to its plant 42 x 113 feet.

Bridges and Buildings.

Vierling, McDowell & Co., Chicago, have been awarded the contract for the steel work on the large addition that is to be made to the Hotel Oliver at South Bend, Ind. Shepley, Rutan & Coolidge, Chicago, are architects.

The William Grace Company, Chicago, has the general contract for a large steel coliseum or pavilion to be erected by the Union Stock Yards & Transit Company for the annual fat stock show purposes. The building will be 225 x 650 feet, one story in hight, consisting of a steel frame work with brick veneer. It will cost $175,000. Steel contract was let to the Modern Steel Construction Company, Waukesha, Wis.

George L. Mesker & Co., Indianapolis, Ind., are building a four-story addition, 150 x 185 feet, to their present plant at Water and Ingle streets. All necessary machinery for this plant has been purchased, except two electric elevators. The firm is a large factor in the manufacture of store fronts and in the execution of sheet and structural iron work generally.

Mitchell & Pigy, Weatherford, Texas, were awarded contracts May 12 for two steel bridges across the Brazos River, each 800 feet long. The structures will cost $28,000.

John A. Ross, Frankfort, Ind., has been given the contract for the construction of a 275-foot bridge across the Eel River at Stockdale, Ind. The cost will be about $12,000.

Fires.

The Boston Fibre Company's mill No. 3, Willimantic, Conn., was destroyed by fire May 15, together with 90 tons of leather board.

The Wire Works of E. H. Titchener & Co., Binghamton, N. Y., was recently seriously damaged by fire.

S. H. Kerr's sheet iron works at Lufkin, Texas, was recently damaged $2000 by fire.

The blacksmith's shop of the Elizabeth Iron Works, Norfolk, Va., was destroyed by fire on May 11. The loss is placed at $25,000.

Hardware.

The Granite State Tack Company, East Jaffrey, N. H., is to erect an additional factory building and will considerably increase its manufacturing facilities. The company has recently been incorporated under Maine laws with an authorized capital stock of $100,000. The officers are: President, Wilbur Webster, East Jaffrey; treasurer, W. E. Webster, East Jaffrey, and clerk, Joseph Williamson, Augusta, Maine. The company manufactures shoe tacks and nails, and has conducted the business at East Jaffrey, under the same name, for the past ten years.

The Side Weight Horse Shoe Company, Hartford, Conn., has outgrown its present quarters and has leased a factory building, 41 x 67 feet and one story, now in course of erection, and another building already completed, which will afford considerable additional manufacturing facilities.

Lawrence Brotners, Sterling, Ill., have been gradually enlarging their plant until they now have a three-story building, 60 x 300 feet, and a two-story building, 50 x 200 feet. They have added largely to their lines of builders' hardware, door hangers and the like, and report that even their present quarters are none too great to accommodate their business.

Rossman Mfg. Company, successor to Rossman Woven Wire Fence Company, Rossman, Columbia County, N. Y., has recently completed a new 320-foot dam, materially enlarging the company's power. Several new machines for the manufacture of the Rossman tree guards and hitching posts have also been added. The company has added to its products the Rossman steel flexible rolling mat.

The National Cutlery Company, Philadelphia, Pa., will soon remove to its new factory at Boudinot and Westmoreland streets. This large plant, which is up to date in all its appointments, will put the company in a position to take the best care of its steadily growing business.

Williamson Mfg. Company, Bradford, Pa., manufacturer of the Williamson universal double swivel vises, with or without quick acting or swivel jaw movement, refers to the large and increasing demand from the trade at home and abroad, indicating the favor with which the goods are regarded.

The A. J. Reach Company, Philadelphia, Pa., manufacturer of sporting goods, is building a four-story and basement brick addition, 59 x 90 feet, to its plant at Tulip and Eyre streets. A large part of the addition will be used for storage purposes.

The business of the Niagara File & Rasp Works, Lockport, N. Y., which has been operated for several years by W. G. Ager, who has had many years' experience in file manufacture, having grown beyond the capacity of the plant, Mr. Ager has sold a part interest to Chas. Ashton, formerly with the Leeds Saw & Tool Works, Leeds, England. The business has been incorporated, with Mr. Ashton as treasurer, and will be removed to Buffalo if a suitable site can be secured.

Miscellaneous.

Charles B. Gaskill, Max Amberg, Charles B. Hyde, George G. Shepard, Alexander J. Porter and F. G. Anderson have organized the Niagara River Mfg. Company and will erect a plant on the lands of the Niagara Falls Power Company at Niagara Falls, N. Y., for manufacturing wood pulp and by-products. A site has been selected on the river at the foot of Iroquois street, where a building 40 x 80 feet will be put up in June. Machinery will be installed as rapidly as possible in order that the mill may be operated at the earliest possible moment.

The Illinois Foundry & Engineering Company, Granite City, Ill., has just completed a pattern storage building of steel construction, which gives it 4000 square feet of additional floor space for the storage of patterns. The company reports business to be extremely good and has orders booked which will keep its shop running to full capacity for 30 days.

The Ford Motor Company, Detroit, Mich., is considering the erection of a large addition to its automobile factory.

The Illinois Corrugated Steel Company is a new concern at Bloomington, Ill. It will manufacture a patent galvanized corrugated sheet steel culvert and other specialties made from corrugated sheet steel. The company has leased the ground and warehouse on the site of the cereal mills which were destroyed by fire several years ago, and the warehouse has been converted into a temporary factory building. Practically all the equipment has been installed. The factory will be electrically operated, the company having contracted with a local firm for its power. Russell Woolbridge, Crawfordsville, Ind., is active head of the enterprise, and associated with him is C. D. Voris, also of Crawfordsville.

The Medfield Mfg. Company, Medfield, Mass., has been organized under Massachusetts laws with a capital stock of $5000, to take over the wire covering business formerly conducted by the William Marshall Company, Medfield. The business is chiefly in bonnet wire. William Marshall, formerly of the firm of M. F. Clark & Co., will attend to the manufacturing end of the business. The officers of the new corporation are: President, John A. Cross, Providence, R. I.; treasurer and clerk, Charles W. Wolcott, Dedham, Mass.; directors, these officers and William Marshall, Medfield.

The Bristol-Plainville Tramway Company, Bristol, Conn., is to establish an illuminating gas plant in that town. There will be a generator house, 34 x 71 feet and two stories; a purifier house, 33 x 40 feet and two stories, and a governor and meter house, 20 x 20 feet. The buildings will be of brick and steel.

The name of the Vaughan Machine Company, Peabody, Mass., manufacturer of automobiles, has been changed to the Corwin Mfg. Company, the new name going into effect May 22. The new appellation is because of the ownership and management of Hamilton S. Corwin, the president of the corporation. No change in the corporate existence of the company will result.

The E. Ingraham Company, clock manufacturer, Bristol, Conn., is planning to erect a one and a two story brick building, but definite decision as to what will be done has not yet been made.

Formal announcement has been made of the consolidation of the Stanley Electric Mfg. Company and the General Incandescent Arc Light Company under the corporate title of Stanley G. I. Electric Mfg. Company, and the works and general offices will be at Pittsfield, Mass.

The Uncas Specialty Company, Norwich, Conn., has leased the carpet lining factory at Thamseville, a suburb of that city, and will occupy it for the manufacture of the Leavitt patent ball contact timer, the inventor of which, B. F. Leavitt, is the manager of the business. Mr. Leavitt was until recently connected with the Brooklyn Automobile Company, Brooklyn.

The D. R. Armstrong Varnish Works, Chicago, Ill., will have plans completed in about a month for rebuilding its works, which were recently destroyed by fire. The company is now occupying temporary quarters.

The business of Henry Burden, 2d, Cazenovia, N. Y., has been taken over by the Cazenovia Electric Company, which was recently incorporated with a capital stock of $30,000.

The Jersey City Stock Yards Company, Jersey City, N. J., has purchased the machinery for equipping its new buildings. The two main buildings will include a hog abattoir, 105 x 135 feet, and a sheep abattoir, 75 x 2598 feet.

The Evansville Battery & Electric Company has been incorporated at Evansville, Ind., with $100,000 capital stock by Willis M. Copeland, Albert F. Karges, John C. Zutt, Louis A. Daus and Henry C. Porter.

The Brazil Surgical Instrument Mfg. Company has been incorporated at Brazil, Ind., with $25,000 by John D. Sourwine, Walter C. S. Acheson and E. V. K. Acheson.

The Princeton Coal Company, Princeton, Ind., is asking for bids for a new tipple house and the installing of automatic self dumping cars.

The Pelham Engineering & Construction Company, New York, has been organized with a capital stock of $10,000 to build an electric railroad from McKeesport to Irwin, Pa., Robt. J. Beach, 32 Broadwuay, New York, one of the directors of the company, having previously been awarded the contract. The company is already well equipped to do the work.

The Buffalo & Susquehanna Iron Company's new steel steamer "Stephen M. Clement" was successfully launched at Lorain, Ohio, on the 19th inst. The new steamer has the hopper arch construction, her dimensions being: Length over all, 500 feet; keel, 480 feet; beam, 52 feet; depth, 30 feet; carrying capacity, 9000 tons, and cost $330,000. The "Clement" is a duplicate of the new steamers "Philip Minch" and "Ball Brothers," recently launched at Lorain for the same company.

The Standard Pattern & Mfg. Company has been incorporated at Richmond, Ind., by John A. Shutz, Charles L. Newcomb and Madison L. Kirkman.

The J. I. Holcomb brush factory will be moved from Sullivan, Ind., to Indianapolis, where its site has been selected on the Belt Railroad. It makes about 500 different patterns of brushes. J. I. Holcomb, president, is interested in the American Box Ball Company of Indianapolis, which will occupy a part of the new plant.

The Laycock Power-House Company, Indianapolis, Ind., has been organized and incorporated with a capital stock of $250,000. T. B. Laycock, president of the T. B. Laycock Mfg. Company, maker of iron and brass beds, is president; Charles E. Coffin, vice-president; I. N. Richie, second vice-president; Charles E. Holloway, treasurer, and James F. Lindley, secretary. The object of the company is to gather small industries under one roof, to supply them with power, central shipping facilities, one executive and clerical force and other economies resulting from combination and consolidation, at the same time allowing them to maintain individuality and independence. Additions will be built to the buildings now occupied by the T. B. Laycock Mfg. Company. The whole plant will occupy a full square of ground and will have a floor space of more than 382,000 square feet. The T. B. Laycock Mfg. Company will erect a new plant in another part of the city. Speaking of the new enterprise Mr. Laycock says: "It is a matter of common knowledge that there are many small manufacturers who cannot afford to have any sort of executive or clerical force and cannot practice economies as to shipping, sale of goods and generating power. Many of them, though excellent mechanics, have little business or executive ability. Another advantage will be a competent credit man to be employed by the company for all those who rent space. There will be room for about 40 independent manufacturers."

The Iron and Metal Trades

In all the leading distributing centers the Pig Iron market is very quiet. No sales of any consequence for forward delivery have taken place, but there is a fair volume of orders for early delivery and consumers are taking their Iron on old contracts steadily. A very sharp distinction must be made between the volume of buying and the current or future consumption. Production has been very slightly in excess of requirements, but that does not mean that consumption is not going on at an unprecedented rate. In fact, there are some indications that the foundry trade, which has disappointed possibly extravagant expectations, is picking up a little.

Sentiment has changed, however; prices are weaker and buyers are holding off, convinced that a somewhat lower level in Pig Iron will be reached.

Some reports have been current that the United States Steel Corporation would purchase Pig Iron for June delivery, and color to that hope has been given by the fact that five of the furnaces have been blown out, these being two stacks in the Cleveland district, one in the Mahoning Valley, one in Pittsburgh and one in the Wheeling district. It is authoritatively stated, however, that from present indications such purchases in the open market for June are not probable.

The maximum in production has evidently been passed. In addition to the furnaces referred to, Cleveland and Punxsutawney have blown out for relining and one Niagara is just blowing out.

Steel Billets are somewhat easier, and it is worthy of notice that the leading interest is again offering Steel more freely abroad.

As for the finished products, the matter lies in a nutshell: The buying and the consumption in the heavy lines are very great and promise to continue, to judge from the orders booked and the new tonnage coming up. In the lighter lines, distributed chiefly by the jobbing trade, the merchants bought late last year and early this year, and bought heavily in anticipation of the spring demand, tempted by low prices. The mills therefore were rushed and are still busy either making deliveries or accumulating the usual stocks. The summer dullness has therefore been transferred to the spring.

Many of the jobbers overbought, and having good margins below official prices, which had been advanced in the meantime, have made concessions. There are now conflicting reports as to the extent to which they have cleaned up. Some observers state that, notably in Tubes, the movement has lately been heavy.

In the Rail trade there has been some new business. One Northern mill has taken 12,000 tons for an Alabama road and a lot for Michigan, and a number of other orders running up to 5000 tons and over each have been placed. The specifications for the Wabash terminal contract for 12,000 tons have been given. In well informed circles no credence is attached to the report of a Russian order for 40,000 tons. Some months since negotiations were pending at St. Petersburg for a much larger quantity with American mills, but since then the international Rail situation has changed in some important respects.

The Structural mills and Plate mills are getting further good orders. Some large purchases of cars have been made, and five large new steamers have been contracted for with lake shipyards, for four of which the Steel is still to come into the market. Chicago reports a string of very nice orders pending for Steel work for buildings, and New York and other cities have a very good tonnage coming up. Among the larger bridge contracts pending are a lot of 10,000 tons for Virginia and 8000 tons for terminals at Bay Ridge.

The independent makers of Merchant Pipe have had a meeting to discuss the situation at Pittsburgh. An interesting sale is 27 miles of 6-inch Pipe for Kansas, taken by a Youngstown mill. The Skelp mills of Pittsburgh are busier, but the Eastern mills are running very slowly.

While Scrap is still very weak, there are some indications that some of the dealers are turning buyers.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	May24, 1905.	May17, 1905.	Apr.26, 1905.	May25, 1904.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	*$17.25*	$17.25	$17.75	$14.50
Foundry Pig No. 2, Southern, Cincinnati	*15.75*	15.75	16.25	12.00
Foundry Pig No.2, Local, Chicago	17.25	17.25	17.25	13.50
Bessemer Pig, Pittsburgh	*16.10*	16.10	16.35	13.35
Gray Forge, Pittsburgh	*15.50*	15.60	15.60	12.50
Lake Superior Charcoal, Chicago	*17.50*	17.50	18.50	15.00
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	*23.00*	23.00	24.00	23.00
Steel Forging Billets, Pittsburgh	*26.00*	26.00	27.00	....
Steel Billets, Philadelphia	*27.00*	27.00	28.00	24.00
Steel Billets, Chicago	28.00	28.00	28.00	24.00
Wire Rods, Pittsburgh	34.00	34.00	34.00	30.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*13.00*	13.00	14.00	10.00
O. Steel Rails, Philadelphia	*16.00*	16.50	18.00	12.00
O. Iron Rails, Chicago	*18.00*	18.50	19.50	14.00
O. Iron Rails, Philadelphia	*20.00*	22.50	24.00	15.00
O. Car Wheels, Chicago	*14.75*	15.00	15.00	12.50
O. Car Wheels, Philadelphia	*16.00*	16.00	17.00	12.00
Heavy Steel Scrap, Pittsburgh	*14.50*	14.50	16.00	11.75
Heavy Steel Scrap, Chicago	*12.00*	12.50	13.50	9.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	*1.63½*	1.73½	1.73½	1.48½
Common Iron Bars, Chicago	*1.55*	1.55	1.60	1.35
Common Iron Bars, Pittsburgh	*1.50*	1.55	1.60	1.35
Steel Bars, Tidewater	1.64½	1.64½	1.64½	1.49½
Steel Bars, Pittsburgh	1.50	1.50	1.50	1.35
Tank Plates, Tidewater	1.74½	1.74½	1.74½	1.74½
Tank Plates, Pittsburgh	1.60	1.60	1.60	1.60
Beams, Tidewater	1.74½	1.74½	1.74½	1.74½
Beams, Pittsburgh	1.60	1.60	1.60	1.60
Angles, Tidewater	1.74½	1.74½	1.74½	1.74½
Angles, Pittsburgh	1.60	1.60	1.60	1.60
Skelp, Grooved Steel, Pittsburgh	*1.50*	1.50	1.65	1.40
Skelp, Sheared Steel, Pittsburgh	*1.55*	1.55	1.70	1.40
Sheets, No. 27, Pittsburgh	*2.20*	2.30	2.30	2.10
Barb Wire, f.o.b. Pittsburgh	2.25	2.25	2.25	2.50
Wire Nails, f.o.b. Pittsburgh	1.80	1.80	1.80	1.90
Cut Nails, Mill	1.80	1.80	1.80	1.75
METALS:				
Copper, New York	15.00	15.00	15.00	13.00
Spelter, St. Louis	*5.30*	5.30	5.75	4.90
Lead, New York	4.50	4.50	4.50	4.35
Lead, St. Louis	*4.40*	4.45	4.50	4.27½
Tin, New York	**30.25**	30.00	30.20	27.50
Antimony, Hallett, New York	**8.87½**	8.75	8.50	7.00
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.64

Chicago.

FISHER BUILDING, May 24, 1905.—(*By Telegraph.*)

At the biweekly conference of Western sales managers of the United States Steel Corporation and its subsidiary companies a very thorough discussion of the present and prospective market conditions was engaged in, and every man who left the meeting did so with the feeling that, barring an act of Providence or a crop calamity, business conditions for the second half of the year will be even better than the first and that whatever temporary weakness may have developed in some commodities is due to the fact that consumers have already bought extremely large tonnages and are well covered. It was concluded by these men, with all the information at hand, that consumption for the second half would be extremely large and that when the buying movement does set in for second half and beyond it will be of a very active character, delivery being a more prominent consideration than price. A factor in this conclusion was the knowledge that so many mills of the leading producer and its constituents are filled with business to the end of 1905 and that nearly all the mills are from one to three months behind their orders. When the buying movement for the fall and winter trade sets in so many mills will be out of the market, it is argued, that those mills that still have tonnages to sell will have no difficulty in securing handsome prices for them. As against this rosy view of the future is the stern reality of the present market, which is characterized by extreme dullness, accompanied by weakness in prices in many lines. Pig Iron has receded 25c. to 50c. almost throughout the list since last week, and outside of Structural Steel and Plates all the finished products are a little weaker in tone than they were a week ago, though prices are still held.

Pig Iron.—A softer tone pervades the whole Pig Iron market and buying is almost at a standstill. Any prices quoted might be considered nominal to the extent that they are the prices at which furnaces are willing to sell rather than the prices which buyers are willing to pay. What little Iron is moving is being sold at about the basis named in the prices below. Local Northern Irons are about 25c. cheaper than a week ago. Silveries, which have been held high in the face of the weakness of other Southern Irons, have now receded to their usual parity with Southern grades. There is no Virginia Basic offered in this market, so we omit quotations on that commodity. Quotations are as follows:

Lake Superior Charcoal	$17.50 to $18.00
Northern Coke Foundry, No. 1	17.75
Northern Coke Foundry, No. 2	17.25
Northern Coke Foundry, No. 3	16.75
Northern Scotch, No. 1	18.00
Ohio Strong Softeners, No. 1	18.30
Ohio Strong Softeners, No. 2	17.80
Southern Silvery, 4 to 6 per cent. Silicon	18.00 to 19.00
Southern Coke, No. 1	17.15 to 17.40
Southern Coke, No. 2	16.65 to 16.90
Southern Coke, No. 3	16.15 to 16.40
Southern Coke, No. 4	15.90 to 16.15
Southern Coke, No. 1 Soft	17.15 to 17.40
Southern Coke, No. 2 Soft	16.65 to 16.90
Southern Gray Forge	15.65 to 15.90
Southern Mottled and White	15.40 to 15.65
Malleable Bessemer	17.25
Standard Bessemer	17.80 to 18.30
Jackson Co. and Ky. Silvery, 6 % Silicon	19.80
Jackson Co. and Ky. Silvery, 7 % Silicon	20.30
Jackson Co. and Ky. Silvery, 8 % Silicon	20.80
Jackson Co. and Ky. Silvery, 10 % Silicon	21.80
Alabama Basic	17.65
Virginia Basic	17.65

Billets.—Open Hearth Forging Billets in from car lots up sell at from $30 to $32 a gross ton for base sizes, with the usual extras. Bessemer Rolling Billets would be quoted at $28 to $30. The tone is a little easier, though Billets are still scarce and hard to get.

Rails and Track Supplies.—An Indiana road ordered something like 3000 tons, which went to a Pittsburgh mill. Rail business has been quiet as far as Standard Sections are concerned. Light Sections and Track Supplies for both standard and narrow gauge roads are active. We repeat last week's quotations as follows: Standard Section Rails $28 per gross ton at maker's mill in 500-ton lots or greater, plus full freight to destination; Light Section Rails, $24 to $27 per gross ton, according to weight and tonnage; Angle Bars, 1.40c. to 1.50c.; Spikes, 1.75c. to 1.85c., f.o.b. Joliet, in car lots; Track Bolts, 2.40c. to 2.50c., base, with Square Nuts, and 10c. to 15c. higher for Hexagon Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Material.—An order for 3000 cars placed by the Chicago & Northwestern Railway with the Pullman Company is reflected in an increased demand for Structural Materials such as go into freight cars. Six large buildings in Chicago have reached a point where the Steel will be closed within a few days, including an office building that will require about 4500 tons, a warehouse that will call for 1600 tons and a hotel that will require something like 1500 tons. Local structural shops are rather slack as a rule, all the large buildings going almost without exception to the American Bridge Company. The scarcity on Beams and Channels, particularly on 4, 5 and 6 inch sizes, is growing worse rather than better, and premium prices as high as 3c. a lb. are paid on some few sections. Official prices for delivery from mill, f.o.b. Chicago, in car lots, are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices on Structural Steel are advancing rapidly, particularly on the smaller shapes. Structural Angles are based on a minimum of 2.10c. from store, ranging from there up to 2.50c. Channels from 3 inches up and I-Beams up to 8 inches call for premiums, some sizes finding a ready market at 3c. a lb., though the minimum base price on Beams and Channels is 2c. from store.

Plates.—The shortage on Plates is growing worse with some mills and less pronounced with others. There are still two large eastern Pennsylvania mills that are able to make prompt deliveries on practically all sizes, one of them still endeavoring to charge a small premium, while the other is avowedly offering its materials at official prices. Official prices are unchanged as follows: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16-inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, Tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, Tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—Although the consumption of both Black and Galvanized Sheets is from all indications very large, the production has been and is ample to take care of it with sufficient of a margin left over to keep prices to large buyers from 5c. to 10c. below the official prices named below. Galvanized Sheets, which were scarce a couple of months ago and on which premiums were asked by some makers, are now weaker than Black Sheets, owing to the large surplus stocks carried by jobbers, which are being offered at prices that are intended to reduce stock. Official quotations for car lots in base sizes are as follows: Blue Annealed Sheets, Nos. 9 and 10, 1.91½c.; Box Annealed Sheets, Nos. 18 and 20, 2.31½c.; do., No. 27, 2.46½c.; do., No., 28, 2.56½c., with the customary differentials between gauges. Store prices are based on a minimum of 2.10c. for No. 10 Blue Annealed, 2.55c. for Nos. 18 and 20 Box Annealed, 2.70c. for No. 27 Box Annealed and 2.80c. for No. 28 Box Annealed. Galvanized Sheets are officially quoted at the following minimum prices at Chicago, in car lots from mill, base sizes: No. 10, 2.51½c.; Nos. 18 and 20, 2.86½c.; No. 27, 3.41½c.; No. 28, 3.61½c. Some mills ask 5c. and 10c. higher. Minimum store prices on Galvanized, base widths, are: Nos. 10, 12 and 14, 3.10c.; Nos. 22 and 24, 3.25c.; No. 27, 3.70c.; No. 28, 3.95c., with the usual differentials between gauges and extras for widths and lengths.

Bars.—The market continues about 1.55c., base, half extras, Chicago, for car lots of Iron Bars, with higher or lower quotations made according to the character and size of the order. Recent orders for freight cars are looked to to strengthen the Iron Bar market. Steel Bars are unchanged at 1.66½c., base, half extras. Hoops are still quoted at 1.81½c., full extras, Chicago. Soft Steel Angles and Shapes are unchanged at 1.57½c., half extras, and Hard Steel Angles and Bars about 10c. below the price for Soft Steel. In store prices Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras; Steel Angles and Shapes, 1.95c., half extras, and Soft Steel Hoops, 2.20c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—No great activity in the contracting movement has yet developed, as buyers seem disposed to hold aloof and play the part of spectators in the hope that the markets may weaken before a period is reached when their contracts must be closed. Prices are firm, as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.23½c.; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—The leading producer takes the stand that it willingly rejects business that cannot be booked at the official prices quoted below, as its mills are filled with business for a comfortable period ahead. Meanwhile independent mills are very glad to get business at from one to two points better discount. There is no doubt that the weakness of the market is due to some extent to the extremely large stocks in the hands of jobbers already covered by their contracts with the leading producers. However, the consumption has been great and it is thought by some interests that a period is not far distant when the shoe will be on the other foot, and when jobbers and consumers alike will find some difficulty in securing sufficient prompt mill shipments. The leading producer will not sell for delivery beyond July at present prices. Official discounts are as follows for car lots to consumers, f.o.b. Chicago: Black Steel, 73.35; Galvanized Steel, 63.35; Black Iron, 71.85; Galvanized Iron, 61.85, with the customary differentials for larger and smaller diameters and for X and XX strong.

Boiler Tubes.—The market for Boiler Tubes is active and mills seem to be fully employed, some of them being very far behind their orders. The following discounts on car lots, from mill at Chicago, prevail: Base sizes, ¾ to 5 inches, Steel Tubes, 60.35; Iron, 49.35; Seamless Steel, 50.85. Larger and smaller diameters take the usual extras in price and less than car lots are quoted at two points less discount. We quote from store:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	30
2¾ to 3 inches	60	47½	42½
6 inches and larger	50	35	..

Cast Iron Pipe.—The city of Cleveland placed an order for about 3300 tons with the leading producers. Bakersfield, Cal., is in the market for about 750 tons. Belding, Mich., is in the market for about 1100 tons. The city of Port Huron, Mich., has contracted with the American Car & Foundry Company at Detroit for about 400 tons. In general the Pipe market is rather quiet, compared with the last few months, but foundries are still fully employed. We quote ordinary lots at $29 a gross ton for 4-inch Pipe and $28 for 6-inch and larger, with $1 a ton higher for Gas Pipe.

Old Materials.—Markets rule lower in tone, but in spite of that the Rock Island, the Burlington and the St. Paul roads all disposed of large tonnages. The consuming demand is very slack, but dealers still have sufficient faith in the market to buy materials offered. We quote:

Old Iron Rails	$18.00 to $18.50
Old Steel Rails, 4 feet and over	13.50 to 14.00
Old Steel Rails, less than 4 feet	13.00 to 13.50
Heavy Relaying Rails, subject to inspection	22.25 to 22.75
Heavy Relaying Rails, for side tracks	19.50 to 20.00
Old Car Wheels	14.75 to 15.25
Heavy Melting Steel Scrap	12.00 to 12.50
Frogs, Switches and Guards	12.00 to 12.50
Mixed Steel	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates	$15.50 to $16.00
Iron Car Axles	20.00 to 20.50
Steel Car Axles	15.50 to 16.00
No. 1 Railroad Wrought	13.50 to 14.00
No. 2 Railroad Wrought	12.50 to 13.00
Shafting	15.00 to 15.50
No. 1 Dealers' Forge	10.00 to 10.50
Wrought Pipes and Flues	9.25 to 9.50
No. 1 Cut Busheling	9.00 to 9.50
Iron Axle Turnings	9.25 to 9.50
Soft Steel Axle Turnings	9.25 to 9.50
Machine Shop Turnings	9.00 to 9.25
Cast Borings	7.00 to 7.50
Mixed Borings, &c	7.00 to 7.50
No. 1 Mill	8.50 to 9.00
Country Sheet	7.00 to 7.50
No. 1 Boilers, cut to Sheets and Rings	9.25 to 9.50
No. 1 Cast Scrap	12.50 to 13.00
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.50 to 12.00

Metals.—Pig Tin is weaker, being quoted at 30⅝c. to 31c. in car lots and 31¼c. to 32c. in smaller lots. Spelter is ¼c. lower, the present price being 5.50c. for car lots and 5.75c. to 6c. for small lots. Casting Copper is 14⅞c. to 15c., Lake at 15c. to 15⅛c. in car lots, with ¼c. to ½c. higher for small lots. Lead is quoted in 50-ton lots at 4.55c., in car lots at 4.60c., and 5c. to 5.25c. in small lots. Sheet Zinc is held at $7.25, base, La Salle, equivalent, after deducting discounts, to $7, Chicago, for car lots of 600-lb. casks, with small lots selling at $7.50 to $8. Prices of Old Copper and Brass are as follows: Copper Wire, 13¼c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12¾c.; Red Brass, 11¾c.; Red Brass Borings, 9¾c.; Yellow Brass, Heavy, 8½c.; Yellow Brass Borings, 7⅞c.; Light Brass, 7c.; Lead Pipe, 4¼c.; Tea Lead, 3.85c.; Zinc, 4.35c.; Pewter, No. 1, 19¼c.; Block Tin Pipe, 25c.

Coke.—Connellsville Coke, claimed by its sellers to be strictly 72-hour Foundry quality, has been sold in the Chicago market within the last week as low as $4.85, or equivalent to $2.20 at the ovens. The legitimate price, however, seems to range from $2.25 to $2.50 at the ovens for Foundry grade and from $1.80 to $2.10 on Furnace grade. Very little Coke is moving. The International Harvester Company has sent out an inquiry for prices on 15,000 tons for 12 months' delivery, but has concluded to delay closing until the market becomes more settled.

The city of Chicago has awarded to the Illinois Iron & Metal Company, Chicago, a contract by which the latter company will buy all of the accumulations of Scrap Metal for the next two months at the following basis per net ton: Wrought Iron, $12.25; Wrought Iron Pipe, $10.75; Cast Iron, $12.85; Burnt Grate Bars, $8.25; Iron Wire, $9. Nonferrous metals will be purchased at the following basis per 100 lbs.: Heavy Red Brass, $11.75; Light Red Brass, $9.25; Heavy Yellow Brass, $8.25; Light Yellow Brass, $6.

The Chicago office of the Carbon Steel Company, Edward K. Harris, manager, has been moved from room 701 to 1506 Fisher Building, Chicago.

Philadelphia.

FORREST BUILDING, May 23, 1905.

It is difficult to say that there has been any new development in the Iron and Steel trades during the past week. Conditions are not bad by any means, yet there is a want of confidence that is not satisfactory. It is recognized that Pig Iron has not only lost its buoyancy, but that it is also seeking a new level of prices; but what that level will be is an unknown factor. The trade do not expect that it will be much below to-day's figures, but the chief disappointment is that there should be any recession at all. A majority of the most experienced men in the trade were confidently looking for something between $18 and $20 as fairly safe figures for the last half of the year, and had very little idea that $16.50 to $17.50 would be open quotations before the second quarter had expired, yet they are already confronted with figures of that kind, with a possibility that they may go still lower before the right kind of buying can be secured. That the feeling in the trade was too sanguine needs no argument, but it is not because their theories in regard to consumption were at fault, but rather because the producing capacity of the country was underestimated. This discovery has developed a change of sentiment, so that those who would buy anything three months ago are now determined to buy nothing until they can see a little further ahead. This, of course, is a perfectly natural development, although it is hard to explain why a mere matter of sentiment should within a few weeks completely change the appearance of an industry of such enormous proportions as that in Iron and Steel. The question which underlies the entire subject is this: Has there been any change in actual conditions during the past three months to warrant any change of views in regard to the outlook for the last half of the year? In general terms the question can be answered in the negative, except, as we said before, that sentiment has changed. It is true that Wall Street is acting badly, and may have some influence on general business if it continues its doleful predictions, but it is not at all unlikely that it will take a sudden turn some of these days, declaring that unprecedented prosperity prevails throughout the entire land, so that Wall Street should not be taken too seriously. A factor of the greatest importance will be in regard to crops, but it is too early for any very definite estimates to be made. Three or four weeks ago the crop experts gave the most glowing reports, while latterly they have toned them down considerably, but there is plenty of time for further revisions, so that business will undoubtedly hesitate until something fairly definite is known. The influences above named may not necessarily be unfavorable, but they are inimical to an immediate resumption of activity, pending which prices in some lines may possibly seek a somewhat lower level.

Pig Iron.—The demand for Iron during the week has been of a purely retail character, large buyers having practically withdrawn from the market. Ordinarily this would indicate unfavorable conditions (and they are not at all satisfactory), but the fact that order books are well filled and that deliveries are promptly taken relieves the tension considerably. Prices are weak, however, and to that extent the outlook is not favorable for improvement until well on toward midsummer, and even then it will depend upon influences which are still undetermined and which we have already considered. Consumption is probably the heaviest on record, but the fact that production leads it is no stimulus to consumers to further anticipate their requirements, consequently there is every indication of a waiting market until there is something of a much more positive character than can be found at the present time. Prices are too uncertain to be quoted with exactness; in point of fact there is not demand enough to make a market in the ordinary sense of the word. Small lots are taken at rates quoted below, but large lots are not asked for, and as makers have no great tonnages on their hands they are under no necessity to force business. It is quite probable, however, that 25c. better could be done on firm offers for good sized lots, failing which we quote as follows in ordinary cases, deliveries Philadelphia or nearby points:

No. 1 X Foundry	$18.00 to $18.25
No. 2 X Foundry	17.25 to 17.50
No. 2 Plain	16.50 to 17.00
No. 3 Foundry	15.50 to 15.75
No. 4 Foundry	14.75 to 15.00
Standard Gray Forge	15.50 to 16.00
Basic	16.25 to 16.50
Low Phosphorus	20.50 to 21.00

Steel.—Buyers are holding off, although they need material and will have to buy before long. The usual price is $27 for Billets, but for the right kind of an order concessions could probably be had if firm offers were made.

Muck Bar.—There is no demand at all and lots bought some time ago are not taken as they should be, although it is believed that the postponement will not be very protracted. Meanwhile orders could be placed at less than $29, provided bids were made.

Ferromanganese.—No demand and not likely to be for the present, as buyers are amply covered for some months to come. Prices nominally $49, on dock, to $49.50 to $50, delivered.

Plates.—Reports are a little mixed, but as a rule business is very satisfactory. Some of the smaller mills complain that specifications are not coming in as could be desired, while with the large concerns the complaint it that they cannot deliver fast enough. New business is on a satisfactory scale and prospects for the next few months are of a most encouraging character. Prices are firm and unchanged, as follows:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under	1.63½	1.68½
Flange or Boiler Steel	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100
3-16-inch thick	$0.10 pounds extra.
Nos. 7 and 8, B. W. G.	.15 "
No. 9, B. W. G.	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—Little need be said in regard to this interest except that there is all the business that can be attended to with reasonable promptness. In many cases premiums have to be paid for June and July shipments, but official quotations are unchanged as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—There is a slightly easier feeling in regard to refined Bar Iron, but the market is in good condition, considering the circumstances. There is a fair amount of business passing at 1.63½c. to 1.68½c., and in some cases first-class Refined Iron commands 1.73½c., but a good deal depends on circumstances. Raw materials are lower, and when a good buyer puts in a bid for a nice tonnage, with a guarantee of specifying at fixed dates, a comparatively low figure may be quoted, but for an open order mills usually want pretty full prices. Steel Bars are firm and almost on a parity with Refined Bars when early deliveries are required.

Sheets.—The demand is mostly for small lots, but there is enough of it to keep the mills fairly well employed, although they have not much work ahead of them. Prices about as last quoted—viz.: 18 to 20 gauge, 2.40c.; 22 to 24 gauge, 2.50c.; 25 and 26 gauge, 2.60c.; 27 gauge, 2.70c., and 28 gauge, 2.80c. Best grades are two to three tenths higher.

Old Material.—There is no market upon which to base definite quotations. Buyers who need a little material might pay the inside quotations, and, although holders ask more money, there is a disposition to accept business if it does not involve too much of a concession. General quotations are about as follows for deliveries in buyers' yards:

Scrap Rails	$16.00 to $16.50
No. 1 Steel Scrap	15.50 to 16.00
Old Steel Axles	18.50 to 19.50
Old Iron Axles	24.00 to 25.00
Old Iron Rails	20.00 to 21.00
Old Car Wheels	16.00 to 17.00
Choice Scrap, R. R. No. 1 Wrought	18.00 to 19.00
No. 1 Yard Scrap	17.00 to 17.50
Long and Short	16.00 to 16.50
Machinery Scrap	15.00 to 15.50
Low Phosphorus Scrap	21.50 to 22.50
Wrought Iron Pipe	14.00 to 14.50
No. 1 Forge Fire Scrap	15.00 to 15.50
No. 2 Light Ordinary	10.50 to 11.00
Wrought Turnings	13.00 to 13.50
Axle Turnings, Choice Heavy	14.00 to 14.50
Cast Borings	9.50 to 10.00
Stove Plates	10.50 to 11.00

Cincinnati.

FIFTH AND MAIN STS., May 24, 1905.—(*By Telegraph.*)

Pig Iron.—A view of the situation locally shows the market to be about as quiet as it could well be and still deserve its name. Outside of a hand to mouth buying that is always present there have been no sales of any moment whatever. Agents report an occasional carload sale, with a small number of inquiries, not to exceed a couple of hundred tons each, all for prompt shipment and of no special bearing on the market in general. There has not been enough sales made during the week in this territory to establish what would be denominated a market quotation, and all that can be said along this line is merely that furnaces are holding to the schedule of prices that have existed during the past three or four weeks. Should consumers suddenly come into the market for a large tonnage it is difficult to predict just what the result would be, but as matters stand at present there is very little prospect of any such contingency arising. Consumers, as a rule, are known to be fully covered until July, and there can be no reasonable expectation of any activity manifesting itself prior to that date. The general appearance of the situation would indicate that consumers have concluded to assume a waiting attitude pending the time that shall elapse until it becomes absolutely necessary to purchase for the protection of their plans. The situation as regards local foundries is practically the same as it has been for some months past, specialty work only being in demand, with general jobbing trade below normal. The consensus of opinion among the different sales agencies is that for the present it were better that traveling Pig Iron salesmen remain at headquarters pending a revival of activity. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$16.25
Southern Coke, No. 2	15.75
Southern Coke, No. 3	15.25
Southern Coke, No. 4	14.75
Southern Coke, No. 1 Soft	16.25
Southern Coke, No. 2 Soft	15.75
Southern Coke, Gray Forge	14.75
Southern Coke, Mottled	14.25
Ohio Silvery, No. 1	$20.40 to 20.65
Lake Superior Coke, No. 1	17.15 to 17.40
Lake Superior Coke, No. 2	16.65 to 16.90
Lake Superior Coke, No. 3	16.15 to 16.40
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	$18.50 to $19.00
Lake Superior Car Wheel and Malleable	18.00 to 18.50

Coke.—There are no new contracts being made, and the market is comparatively quiet. Blast furnaces are said to be feeling the market for their supply for last half, as is their custom at this season of the year. Prices are about the same, the best grade of Connellsville bringing from $2.40 to $2.75, f.o.b. ovens.

Plates and Bars.—A little less activity is said to exist for this class of material, with the possible exception of Structural Iron, which is in fair demand. Prices are said to be unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in small lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; in smaller lots, 2.70c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.83c., in carload lots.

Old Material.—The market is weak and the report is that there is very little doing. Dealers predict that there will be no change for the better for 30 days or more. Prices are said to be the same as reported last week, although there is apparently a disposition to shade them somewhat. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $15 to $16 per net ton; No. 1 Cast Scrap, $12 to $12.50 per net ton; Iron Rails, $18 per gross ton; Steel Rails, rolling mill lengths, $13.50 per gross ton; Relaying Rails, 56-lb. and upward, $23 per gross ton; Iron Axles, $19.50 to $20 per net ton; Car Wheels, $16 to $17 per gross ton; Heavy Melting Scrap, $13 per gross ton; Low Phosphorus Scrap, $16 to $16.50 per gross ton.

Birmingham.

BIRMINGHAM, ALA., May 22, 1905.

The Iron market for some time has been reported as dull and very dull; and its condition in this respect has not changed. What business was concluded was mainly of a retail character, and poking Iron at buyers was equivalent to ridding the market of inquiry. The majority of the offers made evoked only an occasional nibble. There was no biting by hungry mouths. The policy heretofore mentioned of anticipating and calling for maturing deliveries was continued during the week, but the amounts so absorbed were not replaced by long delivery lots. The writer cannot recall the time when the market was more listless than it has been of late. The sellers are all paddling their own canoes. The consequence is that one can buy from some a limited order on the basis of $13 for No. 2 Foundry, while there are others who are holding for $13.25 basis, and a few who are stoutly holding at $13.50.

The varying prices represent the various degrees of faith that possess the sellers. After combing the market thoroughly for the size of lots sold, the two highest lots in volume were one for 500 tons, which was sold on a $13.25 basis, and one lot for 400 tons that was sold on analysis and to run 3 per cent. silicon, 0.05 sulphur. This latter lot is reported by seller on the basis of $13.50 for No. 2 Foundry. Then there were other small lots that were sold in the regular way on the basis of $13, shipment to be prompt or nearby. There was one sale not concluded until late on the preceding Saturday that was carried to the credit of the past week. It was reported on the basis of $13.25 for No. 2 Foundry. These are representative sales and they will give buyers a correct idea of the character of the market. There were other lots sold, but the character of the sales was of the retail kind. The total for the week would not be satisfactory for one day to some of our interests, on an ordinary market.

From other districts we hear of the development of a much better inquiry. This same inquiry is due here, but it has not yet reached us. There is a good deal of talk about its being on the way, but it has met with some detention. These are about the real conditions of the market. Our condition as to output has not changed.

The market for Scrap Iron shows a further reduction this week and we quote: Stove Plate, $9; Heavy Cast Scrap, $11; Old Iron Rails, $18; Old Steel Rails, $13; Steel Scrap from Open Hearth, $13; Iron Car Axles, $17; Steel Car Axles, $14; Old Car Wheels, $15; Relaying Rails, $22; Railroad Wrought, $16.50.

There is a quiet condition of affairs in both Coal and Coke. While there is no change as yet in quotations, it may be said that the feeling is easier and the demand is light. We have this condition of affairs existing every year about this time. The annual meeting of the miners is but a short time ahead of us, when there will have to be an agreement arrived at for the coming year in miners' wages. The most of the Coal being mined is on the open mine plan, and it is not likely that there will be contracts made with the Miners' Union as an organization. It is thought in usually well informed circles that the scale of wages in force now will be continued into the coming year. At this scale the miner who works steadily earns good wages. There has been an increase in the use of Coal cutters and other appliances for

supplanting the ordinary pick in Coal mining, and the output will probably increase faster in the future than in the past.

Coal is quoted at $1.25 to $1.35 for run of the mines, and this price could be shaded under favorable circumstances. There are other seams that command special price, because they are of special quality. Coke is perhaps easier than it has been for a good while back. While still quoted as high as $3.75 for Furnace Coke, it can be had at $3.50, while Foundry Coke is quoted at $3.75 to $4. There is always a slacking up during the convention of the miners and the custom will probably prevail this year, and we may anticipate only a moderate output until the question of wages is decided for the coming year.

Gossip concerning a new Steel mill is being revived, but there is nothing solid as yet on which to base the assertions concerning it. Information justifies the assertion that its erection in the near future is very probable. Beyond that nothing can be said. Within the next 12 months, certainly within two years, our capacity for making Pipe will be double the present capacity. We are increasing our furnace capacity, or preparing to do it, and if we only continue to grow to the industrial clothes being made for us it won't be long before we will be too big again for our breeches and will have to advocate expansion.

Pittsburgh.

PARK BUILDING, May 24, 1905.—(*By Telegraph.*)

Pig Iron.—The fact that the Carnegie Steel Company has five blast furnaces idle now, with the probability that three or four more stacks will go out for necessary repairs before July 1, lends strong reasons for believing that the Steel Corporation will be a purchaser of Bessemer Iron for June shipment. Should the corporation buy 50,000 tons or more it would take up much of the surplus Iron now being piled at the merchant furnaces in the two Valleys. There is very little inquiry for Pig Iron, but prices are reasonably firm, Bessemer and Basic Iron being held at $15.25 to $15.50, Valley furnace, or $16.10 to $16.35, Pittsburgh, the large sellers asking the latter figure. Some warrant Iron is being offered for spot shipment at relatively low prices, but the tonnage is very small and really cuts no figure in the general market. The inquiry for Foundry Iron is of the carload order, none of the large consumers being in the market. The large foundries, such as Westinghouse, Standard Sanitary, Mesta, United Engineering and Mackintosh-Hemphill, are very busy, are using up a great deal of Foundry Iron and are specifying very freely on their contracts. It is a matter of only a short time until some of these large consumers will be in the market as buyers. Northern No. 2 Foundry Iron is about $15.50, Valley furnace, or $16.35, Pittsburgh. Southern No. 2 Foundry is shading $13, Birmingham. There is very little inquiry for Forge Iron, Northern brands being held at $14.65 to $14.75, Valley, or $15.50 to $15.60, Pittsburgh.

Steel.—The demand for Billets and Sheet and Tin Bars continues fairly heavy, but is not as active as some time ago, particularly for Sheet and Tin Bars. We quote Bessemer Billets at $23 and Sheet and Tin Bars, random lengths, $25, maker's mill, for prompt shipment. For Open Hearth Steel about $1 a ton advance is asked over these prices.

(*By Mail.*)

General conditions in the Iron trade do not show any material change over those given in this report last week, with the exception that some Finished Lines, such as Tin Plate, Sheets, Tubular and Wire Goods, are moving out more freely. This is particularly true of the Pipe trade, conditions in which are very much better than for some time. While it is true that new demand for Finished Iron and Steel is not as large as it has been, yet there is no special cause for alarm, as the mills have plenty of contracts yet to fill and buyers are specifying on these contracts quite freely. It is believed that by the end of June the heavy stocks now in jobbers' hands will be pretty well cleaned up, and if this is the case and there are no business or financial disturbances in the meantime there is no reason why there should not be material improvement in the Iron trade very early in July, if not before. General conditions throughout the country are good, money is plentiful and crops promise to be very heavy. The outlook is that trade in the last half of the year will be quite heavy.

At this writing the Carnegie Steel Company has five blast furnaces idle, with prospects that two or three more may go out within a short time. These idle furnaces have very much decreased the output of Pig Iron by the Carnegie Company this month, which gives strong reasons for believing that the Steel Corporation will buy a large tonnage of Pig Iron early in June. It is figured out that the United States Steel Corporation sells every month over 100,000 tons of Finished Material, such as Billets, Sheet and Tin Bars, Plates and other products, based on the average monthly price of Bessemer Pig Iron, and it is very much to the interest of the Steel Corporation that no serious break takes place in the price of Pig Iron. On the other hand, it is very much to the interest of the Steel Corporation to maintain a steady market, and for these reasons, and also because it will probably need the Iron, the trade expects that the Steel Corporation will buy a large block of Bessemer early next month for June shipment. The nominal price of Bessemer and Basic Iron is $15.50, Valley furnace, but some small odd lots have sold at $15.25 at furnace or lower. Occasionally a lot of storage Iron is offered on the market below these prices, but so far the amount of such Iron offered has been very small. Northern No. 2 Foundry is nominally $15.50, Valley furnace, but there is very little inquiry, only carload and small lots being sold. Northern Forge is quiet in demand, and is about $14.65, Valley furnace, or $15.50, Pittsburgh.

The mills are catching up to some extent on deliveries of Steel, and prices of Bessemer Billets, Sheet and Tin Bars are a shade easier. Bessemer Billets are about $23, maker's mill, for prompt shipment, and Sheet and Tin Bars, $25, for random lengths. Slightly higher prices are asked for Open Hearth stock.

In Finished Iron and Steel the demand is showing betterment and the heavy stocks carried by jobbers are moving out more freely than for some time. Confidence is slowly being restored and the general outlook is better all around. The independent Pipe mills have taken action looking to sustaining of prices, and the Pipe trade is in much better condition than for several months.

Ferromanganese.—The local Ferro market is very quiet in demand, consumers being covered for some time ahead. We quote 80 per cent. Ferro at $49 to $50, in large lots, delivered.

Rods.—The demand is quiet. We quote Bessemer Rods at $34, maker's mill. Basic Chain Rods are held at $35, maker's mill, but there is not much demand.

Steel Rails.—The domestic demand for Rails is quiet, but it is said that a contract for about 40,000 tons for shipment to Russia has about been closed, the business going to a tidewater mill. We quote Standard Sections at $28 at mill, and Light Rails, $23.50 to $27, depending on weight.

Skelp.—The local Skelp mill of Moorhead Brothers & Co., which has been idle a month or more, is starting up this week, the concern having entered some fair sized orders for Skelp. The general demand for Skelp is quiet, very few sales having been made in this market for some time. We quote Bessemer Grooved Skelp at 1.50c. to 1.55c. and Open Hearth 1.55c. to 1.60c., with $1 advance for Sheared. Grooved Iron Skelp is about 1.60c., and Sheared, 1.65c., maker's mill.

Plates.—The Plate market continues very active, and the Carnegie Steel Company has turned over quite a large tonnage of Plates to Eastern mills. The Steel car interests are the heaviest consumers, all of them being very busy on orders for cars, while boiler shops and other consumers are buying very heavily. The present active condition of the Plate mills is assured for the next four months at least. We quote: Tank Plate, ¼ inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges	$0.10
Gauges No. 7 and No. 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A." and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50
Shell Grade of Steel is abandoned.	

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ⅓ of 1 per cent. is allowable. Pacific Coast base, 1.40c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added. No reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Structural Material.—A part of the terminal work for the Pennsylvania Railroad in New York, amounting to about 22,000 tons, has been placed with the American Bridge Company. Additional tonnage for this work is expected to

be ready in a short time. Several good sized local jobs involving considerable tonnage are about ready to close up and will likely be placed this week. A great deal of other work is in sight and the general outlook for the Structural trade is very good. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Sheets.—A fair amount of new tonnage is being placed, but the Sheet mills are running mostly on old contracts placed some time ago, when prices were lower. Mills advise us that it is practically impossible to book new orders for Sheets on the basis of 2.40c., at mill, for No. 28, practically all the new tonnage being placed being taken at about 2.20c. to 2.25c. for No. 27 and 2.30c. to 2.35c. for No. 28. Official prices, which are shaded about $2 a ton by most of the outside mills and also by jobbers for carloads and larger lots, are as follows: Black Sheets, No. 24, box annealed, one pass through cold rolls, 2.15c.; No. 26, 2.25c.; No. 27, 2.30c., and No. 28, 2.40c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.23c.; No. 28, 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 to $1.75 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $2.85 to $2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—Large consumers of both Iron and Steel Bars are covered by contracts at somewhat lower prices than are now ruling and on which they are specifying quite freely. The large implement makers still show a disposition to hold off placing season contracts, but are expected to come in the market with their orders before very long. Iron Bars are somewhat weak in price and we quote at 1.50c., Pittsburgh, for good orders and desirable specifications. We quote Bessemer and Open Hearth Steel Bars at 1.50c. in carloads and larger lots.

Hoops and Bands.—We quote Steel Hoops at 1.65c. and Bands at 1.50c., with usual extras on the latter. Practically no new business is being placed in either, consumers being covered by old contracts at lower prices.

Cotton Ties.—We quote at 85c. per bundle for 3000-bundle lots and over. Buyers are specifying liberally on contracts placed some time ago.

Tin Plate.—There is practically no new demand for Tin Plate, the mills running on old contracts placed some months ago when prices were lower. Jobbers report that their stocks of Tin Plate are moving out more freely and a better demand is expected late in June or early in July. There may be trouble this year in fixing up the Tin Plate wage scale, as the Amalgamated Association has asked advances over the present scale ranging from 10 to 20 per cent. We quote 100-lb. Cokes at $3.50 to $3.55, base, f.o.b. Pittsburgh, terms 30 days, or 2 per cent. off for cash in 10 days.

Merchant Pipe.—A meeting of some of the leading independent Pipe mills was held in the Duquesne Club to-day (Tuesday). The present situation in the Pipe trade was carefully gone over and reports of those present showed that the Pipe trade was in very much better condition than for some time. The demand is showing betterment and large stocks of Pipe carried by jobbers are moving out quite freely. Action was taken by these mills looking to the sustaining of prices and also on other matters of interest to the mills. The Youngstown Sheet & Tube Company has taken a contract for 27 miles of 6-inch Line Pipe from the Texas Company for shipment to the Texas oil fields. This is the first contract for Line Pipe of any consequence placed for some time. Discounts of the outside mills remain two points, or about $4 a ton, lower than those of the leading interest, which to the jobbing trade in carloads are as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ and ¼ inch	67	51	65	49
⅜ and ½ inch	71	59	60	57
¾ to 6 inches	75	65	73½	63½
7 to 12 inches	70	55	68½	53
Extra strong, plain ends, ¼ to ⅜ inch	60	48	58	46
½ to 4 inches	67	55	65	53
4½ to 8 inches	63	51	61	49
Double extra strong, plain ends, ¼ to 8 inches	56	45	54	43

Boiler Tubes.—The demand for both Locomotive and Merchant Tubes is very active and the mills are somewhat behind in deliveries. Prices are firm, discounts to consumers in carloads being as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1¼ inches	41	44
1¾ to 2¼ inches	41	56
2½ inches	46	58
2¾ to 5 inches	53	64
6 to 13 inches	41	56

Merchant Steel.—Large implement makers continue to hold back making contracts, waiting to see whether the present lull will continue and whether it will seriously affect prices. The mills are busy on old contracts, but new tonnage being placed is rather light. The Shafting Association met in New York last week and reaffirmed prices. We quote Smooth Finished Tire, 1.70c.; Railway Spring Steel, 1.70c.; Cutter Shoes, 2.15c. to 2.20c.; Toe Calk Steel, 2c. to 2.05c.; Flat Sleigh Shoe, 1.50c. to 1.55c.; Smooth Finished Machinery Steel, 1.70c. to 1.75c.; Crucible Tool Steel, ordinary grades, 5¾c. to 8c.; extra grades, 10c. and upward. Demand for Shafting is fairly active and we quote Cold Rolled at 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—The demand continues active and the three local concerns that make Railroad Spikes are well filled up with orders. We quote Spikes at $1.70 per 100 lbs. in carloads, f.o.b. maker's mill.

Spelter.—Prices of Spelter continue to steadily decline and there is little or no demand. Prime grades are quoted to-day at about 5.25c., St. Louis, equal to 5.37½c., Pittsburgh. On a firm offer and for spot delivery this price would likely be shaded.

Coke.—The output of Coke in the Connellsville region last week and also shipments showed a falling off over the previous week. The Frick Coke Company is operating practically all its ovens in the region, and shipping its Coke as fast as made to blast furnaces of the Steel Corporation. Both Furnace and Foundry Coke for prompt shipment continue to be offered at relatively low prices, strictly Connellsville Furnace Coke on the basis of $1.90 to $2 and 72-hour Foundry about $2.50 a ton, at oven, to consumers. Main Line Coke is offered as low as $1.50 for Furnace and about $2 to $2.25 for Foundry for prompt shipment. One of the leading Steel interests has made a large contract for Coke for shipment over balance of this year and is negotiating for further purchases for delivery in first half of next year. Last week 120 ovens in the Connellsville region were blown out, leaving 27,652 active out of a total of 30,055 ovens in both Connellsville regions. It seems certain that there will have to be a further restriction in output of Coke unless demand soon shows material betterment.

Iron and Steel Scrap.—Conditions in the Scrap trade are practically lifeless, and not much business is expected until after July 1, when the mills have made repairs, taken inventory and are again in position to take in Scrap. It is a fact that hardly enough Material is being sold to establish prices. In the absence of demand and sales nominal prices are about as follows: Heavy Melting Scrap, $14.50; No. 1 Wrought Scrap, $17; Busheling Scrap, $13; Bundled Sheet Scrap, $13.50; Cast Iron Borings, $10; Wrought Turnings, $12; Machinery Cast Scrap, $15; Steel Rails, short pieces, $14.50; long lengths, $15; Iron Rails, $19, all in gross tons, f.o.b. Pittsburgh. On a firm offer and by consumers that would take in the Scrap promptly it is probable above prices would be shaded.

Cleveland.

CLEVELAND, OHIO, May 23, 1905.

Iron Ore.—Shipments of Iron Ore down the lakes have continued at a high rate of speed. It is understood now that most of the larger vessels have gone under contract to run to the head of the lakes light and bring back Ore. Such a condition would indicate that the Ore shippers anticipate a heavy movement of material and that good dispatch to contract boats is virtually vouchsafed. It would further indicate that the shippers are depending more than usual upon their contract tonnage, expecting to use but a small percentage of wild boats during the year. So far these conditions have been fulfilled, the movement being extremely heavy, the dispatch being exceptional and the employment of wild tonnage being reduced to the minimum. On such boats as are loaded with wild cargoes the rates have held without change at 75c. from Duluth to Ohio ports, 70c. from Marquette and 60c. from Escanaba. These are even with the contract rates. There has been some little inquiry from consumers for new supplies of Ore, but no sales have been made so far. Prices hold as they have been, at $3.75 for Bessemer Old Range, base quality; $3.50 for Bessemer Mesaba; $3.25 for non-Bessemer Old Range, and $3 for non-Bessemer Mesaba.

Pig Iron.—As far as Foundry is concerned, there is a little movement for spot delivery of 50-ton lots, but this is inconsiderable. The price paid on most of this is $16 at the furnace. There are reports that some has been sold as low as $15.50 in the Valley, but the major portion of the Iron is going at $15.75 to $16 in the Valleys for No. 2. The Bessemer and Basic trades are notably weak at the present time. The producers who have been unconcerned about the failure of consumers to cover their needs have begun to change front and a little anxiety is felt, although no efforts have been made to force Iron upon an unwilling market at sacrifice prices. Some furnaces are changing over to the production of Malleable Iron. The Coke situation is still rather

weak, but it is believed that temporarily prices have struck rock bottom. Producers are holding at $2.60 to $2.75 at the oven for the best grades of 72-hour Foundry Coke, with Furnace Coke ranging from $2 to $2.25 at the oven.

Finished Iron and Steel.—The shipbuilding interests are still taking Structural Shapes and Plates for the construction of new ships. Last week the American Shipbuilding Company closed orders for three new Steel steamers, and the latter part of the week the Great Lakes Engineering Company took two orders for big Steel steamers. Prior to the placing of these orders the Steel had been bought for one big ship, which had been previously ordered. The Steel for the other steamers has not been bought. That with an order for a big passenger boat and for other ship construction which has yet not come into the market will make up tonnage of close to 20,000 tons which will come into the market in this immediate territory in the near future. In addition to this tonnage there is very heavy buying by building contractors who failed to cover their needs earlier in the year and who are driven now to supply their wants from the small mills or through the jobbers, paying premiums for what they must have. The larger mills are still actively engaged in shipping on contract. The small mills which have been cutting the price on Sheets to obtain business have continued that policy and are now getting the major portion of what is going. Stock prices have been slightly disturbed by the competition also and have been reduced. Out of stock Blue Annealed is based on No. 10 at 2.15c., and Nos. 22 to 24 at 2.60c. Galvanized Sheets are based on Nos. 22 to 24 at 3.05c. There has been a steady demand for Billets, mostly forging, on which premiums have been paid. The market was somewhat disturbed during the week by a vague rumor, having little substance as far as learned, that the field was being invaded by a concern not usually a seller in this market, who was attracted by the prices being paid. The Rail trade is quiet with prices unchanged. No buying of Bars has turned up as yet, the agricultural implement works holding off their inquiries until the crop outlook is a little more definite. The other consumers have covered their needs for the time being, and consequently Bar Steel is stady and dull on the old basis of 1.50c., Pittsburgh, for both Bessemer and Open Hearth. The Bar Iron market is enigmatical. Producers here are trying to market but little material, feeling unable to meet the competition of the Western producers. The price holds about steady at 1.55c to 1.60c., Youngstown.

Old Material.—The market has been duller and weaker than ever, with some reports that the dealers, tired of holding their stock for a better market, have been turning it over for what it would bring, with a consequent sagging of prices. The general market is not as demoralized as this sort of condition would indicate. About any price that would be quoted at the present time would be approximate and nearly nominal. We revise and quote, all gross tons: Old Steel Rails, $14.50 to $15; Old Iron Rails, $20 to $21; Old Car Wheels, $15 to $15.50; Heavy Melting Steel, $14 to $14.50. All net tons: Cast Springs, $7 to $7.50; No. 1 Busheling, $12.50 to $13; No. 1 Railroad Wrought, $14 to $14.50; Iron Car Axles, $21 to $22; No. 1 Cast, $12.50 to $13; Stove Plate, $9 to $10; Iron and Steel Turnings and Drillings, $10.50 to $11.

New York.

NEW YORK, May 24, 1905.

Pig Iron.—The market in this section has been very quiet, although a fair run of Foundry orders is coming in. There has been some movement in New England, where the Buffalo furnaces are offering Iron at lower prices than the older districts. A break in the Erie Canal is holding up some of the Buffalo shipments. We continue to quote Northern Iron, at tidewater, $17.50 to $18 for No. 1 Foundry, $17 to $17.25 for No. 2 Foundry, $16.50 to $17 for No. 2 Plain and $15.25 to $15.50 for Gray Forge. Alabama and Tennessee Irons are on the basis of $16.75 to $17 for No. 2, New York.

Steel Rails.—Rail makers report a very good run of small orders and also of moderate sized lots, purchased as additions to former contracts placed by the large roads. Among the recent contracts placed is one lot of 12,000 tons to an Alabama road, with a Northern mill. Light Rails are quiet. Standard Rails continue at $28, at mill, while Light Rails are quoted $23 to $25, according to section.

Cast Iron Pipe.—The market is quiet, which is undoubtedly due to the easier tendency of Pig Iron. Cast Iron Pipe and Pig Iron sympathize quite closely. The Eastern foundries, however, are excellently supplied with business for the immediate future and are therefore not particularly anxious over existing conditions. No large lettings are yet in sight. While carload lots are still quoted at $28 per net ton for 6-inch at tidewater, concessions would be made on any considerable quantity.

Finished Iron and Steel.—The Structural line continues to show the greatest activity of any branch of the Finished Iron and Steel trades. The American Bridge Company was the successful bidder for the 21,000 tons of steel work which will be required for the first section of the new Pennsylvania Railroad station in this city. The Philadelphia Rapid Transit contract has not yet been formally closed. Quite a good tonnage was entered during the week by the American Bridge Company, comprising small lots, and the indications are that this week will also prove to be an excellent one for new business. Bids are now in on some important bridge work, including about 10,000 tons for the Deep Water Railroad, Virginia, and about 8000 tons for the Long Island Railroad. While no important contracts were placed the past week for buildings several large propositions are in such shape that they will shortly be placed under contract. Some of these buildings will require from 6000 to 10,000 tons of Steel each. Increased difficulty is reported in securing deliveries of Structural Shapes from the mills. Manufacturers are now naming three to four months as the earliest in which they can promise deliveries. Those requiring prompt shipment are compelled to purchase from dealers having stock in their yards, in which case good premiums are charged. Prices on fabricated work show that bidders are not now so hungry for new business. Other branches of the Finished Iron and Steel trade are considerably less active than the structural line, but nevertheless sales agents report a fair run of new orders. Bar Iron is in good demand, but prices are not now held so closely to the top notch, as manufacturing costs have been reduced through the lower price of Scrap. Quotations at tidewater are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04¾c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.69½c. to 1.74½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

Old Material.—A strong demand for Relaying Rails is the particular feature of the Old Material market. Dealers are now seeking quite actively for such sections of Relaying Rails as will meet the views of buyers. Prices of rolling mill stock, especially Wrought Scrap, have been considerably affected during the past week by forced sales of Scrap which had to be moved. Under such circumstances sellers are compelled to take the best price they can get. It would not be surprising, however, if the corner had now been turned and an improvement should be noted in the demand for Old Material in Eastern markets. Consumers are beginning to remove the embargo on shipments on contracts and are taking deliveries into their yards. Quite a number of large consumers are also rapidly depleting their stocks and will shortly be compelled to lay in considerable quantities. Inquiries are now being received on various classes of Old Material, and, in fact, some quite encouraging sales have been made within the past couple of days. Among the transactions of the week were sales of 500 tons of Heavy Cast, 300 tons of Stove Plate, 200 tons of Heavy Steel Scrap, and scattered sales of Borings and Turnings, aggregating possibly 2000 tons. Leading dealers report themselves buyers rather than sellers at present prices. Quotations per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails	$19.00 to $20.00
Old Steel Rails, rerolling lengths	14.50 to 15.00
Old Steel Rails, short pieces	14.00 to 14.50
Relaying Rails	20.00 to 21.00
Old Car Wheels	15.00 to 16.00
Old Iron Car Axles	20.00 to 21.00
Old Steel Car Axles	17.00 to 18.00
Heavy Melting Steel Scrap	14.00 to 14.50
No. 1 Railroad Wrought Scrap	17.00 to 18.00
No. 1 Yard Wrought Scrap	15.50 to 16.00
Iron Track Scrap	15.00 to 15.50
Wrought Pipe	12.50 to 13.50
Ordinary Light Iron	9.00 to 9.50
Cast Borings	7.00 to 8.00
Wrought Turnings	10.50 to 11.00
No. 1 Machinery Cast	14.50 to 15.00
Stove Plate	12.00 to 12.50

Creditors and stockholders of the Pennsylvania Shovel Company, Warren, Ohio, have raised sufficient money to pay off the indebtedness of $50,000, and will take over the entire plant. A new company will be formed with a capital of $150,000, of which $100,000 will be common and $50,000 preferred stock. It is expected the plant will be put in operation at an early date.

Stockholders of the Flannery Bolt Company, Pittsburgh, will meet July 15 to consider a proposition to increase its capital from $200,000 to $300,000.

The report that the Driggs-Seabury Ordnance Corporation, Sharon, Pa., would double the capacity of its plant is officially denied. It is the intention of the company to materially increase its capital stock in the near future.

An East Indian Projected Iron Industry.

United States Consul Wm. Thomas Fee, Bombay, India, sends the following statement to the Department of Commerce and Labor:

Jamsetjee N. Tata, a wealthy Parsee, known as "the Merchant Prince of Bombay," some years ago started a project to develop the manufacture of iron in India, utilizing the native Indian ores, coal and limestone. Unfortunately for India Mr. Tata died while his projected scheme was yet in the incipient stage. His sons, however, have carried on the preliminary investigations and are now about to organize a syndicate with a cash capital of two crores of rupees ($6,480,000) for the purpose of manufacturing iron.

The necessity in the near future of renewing the rails on the long lines of road in India, supplying new projected lines and those under construction, and the growing demand for structural iron and steel, led Mr. Tata to believe that there would be a demand sufficiently vast to guarantee the promise of large profits to such iron manufacturers as would succeed in utilizing native labor and local raw products. He obtained on most favorable terms concessions from the Government for extensive tracts of ore, coal and limestone lands in the central provinces and native States on the Bengal side of India.

The ore being of superior grade and the coal of inferior quality, much anxiety was apprehended at first as to the success of smelting the high grade ore with a coal carrying low coking qualities. Reports of samples sent to Germany and England for experimentation were not favorable. Some three years ago Mr. Tata visited the United States and made a careful study of its iron works with a view to applying some of the modern methods, new inventions, processes and machinery in use there which might be applicable for coking coal and to the smelting and manufacturing of iron in India. He secured the services of two American expert mining engineers who came out to India to make a thorough investigation of the situation and study the conditions, surroundings and problems connected with the project. In company with the oldest son of the late Mr. Tata (D. J. Tata), they visited the various mining properties in the central provinces and native States and made full examinations. They satisfied themselves as to the richness and the abundance of the ore, the feasibility of coking the coal, and the availability of the limestone and other required raw materials. They carefully studied market conditions, prices, costs of freight and labor, water supply, furnace and mill machinery, Government good will and all factors involved in the project, and have reported that an industry manufacturing a durable iron and steel, founded on the sources of supply indicated, can be established and successfully carried on in India with large profits to investors.

The project is to carry on a complete iron industry, consisting of mines, ovens and mills for the finished product, as well as works for the utilization of the by-products. While the project has not been carried beyond the preliminary steps of investigation the engineers are so well satisfied with the results and are so sanguine of success that they assert that they can produce a high quality of pig iron and lay it down at the port of Calcutta at less cost than can be done elsewhere in the world.

Iron and Industrial Stocks

NEW YORK, May 24, 1905.

Prolonged liquidation marked the course of the past week in the stock market. Stocks of all kinds, including the most gilt-edged railroad stocks as well as the most vulnerable industrials, were poured out from day to day, and at times almost a panicky feeling prevailed. The downward movement appears to have been checked on Tuesday of this week, when announcement was made of the failure of one of the least important trust companies in this city. Indefinite rumors regarding the solvency of some financial institution were believed to have been the cause of a great deal of the weakness in the stock market, and when the failure was announced much relief was felt that it was not a more conspicuous one. The lowest prices reported on active Iron and Steel stocks during this period of pressure were as follows: Can common 10½, preferred 65½; Car & Foundry common 31, preferred 94⅛; Locomotive common 44, preferred 108⅛; Steel Foundries common 11⅝, preferred 50½; Colorado Fuel 38; Pressed Steel common 34, preferred 90½; Railway Spring common 30, preferred 95¾; Republic common 15½, preferred 69; Sloss-Sheffield common 69¾, preferred 104; Tennessee Coal 73; Cast Iron Pipe common 27½, preferred 90; United States Steel common 24⅞, preferred 90¾, new 5's 92¼. The slight improvement on Tuesday carried most prices up one or two points above the low prices noted. The improvement continued to-day, last transactions up to 1.30 p.m. being reported at the following prices: Can common 11¼, preferred 67¼; Car & Foundry common 32½, preferred 95; Locomotive common 46½, preferred 109¼; Colorado Fuel 40⅜; Pressed Steel common 36, preferred 91⅛; Railway Spring common 32¼, preferred 95¾; Republic common 16⅜, preferred 70½; Sloss-Sheffield common 70, preferred 115; Tennessee Coal 75; United States Steel common 26⅜, preferred 93⅛, new 5's 93.

Dividends.—National Lead Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, payable June 15.

The Allegheny Heating Company, Allegheny, Pa., supplier of natural gas, has declared the usual quarterly dividend of 4 per cent., payable May 25.

Metal Market.

NEW YORK, May 24, 1905.

Pig Tin.—The market during the week was dull, with the exception of Tuesday, when a fair business was done. This was caused by two influences, one the Banca sale tomorrow, when 1600 tons will be disposed of by the Dutch Government. It will be remembered that at the last auction sale very high prices were realized, and this fact is exerting a considerable influence on the market at present. Another point which tended to strengthen the market was the announcement of the production of Banca Tin, which for the year 1904-1905 was about 7540 tons, against 12,200 tons in 1903-1904 and an average of about 10,500 tons for the three years preceding that. This had its influence on Friday, when the high prices of the week were realized at 30.40c., but the price quickly dropped back to 30.10c. on Monday and Tuesday of this week. To-day's quotations on the local Metal Exchange are 30c. to 30.35c. for spot and May and 29.75c. to 30.25c. for June, with Tin selling to-day at 30.25c. In London an advance has taken place. The price for spot Tin at the closing of that exchange was £136 15s. and for futures £135 12s. 6d., an advance of 15s. for spot since yesterday. The arrivals so far this month amount to 2001 tons, while there are 1995 tons afloat.

Copper.—The activity noticed last week has subsided to a great extent, and although some few orders have been placed for nearby delivery the market has been rather dull, but with a firm undertone in prices of 15c. for spot and early deliveries of Lake and Electrolytic Copper, slight concessions being made for deliveries into the second and third quarters. Casting grades are held at 14.75c. It is reported on good authority that a considerable quantity of Electrolytic has been sold for October delivery. The phenomenal exports, amounting to 18,377 tons so far this month, of which 6300 tons go to the Orient, are exercising a very potent influence on this market and the statistical position of the metal continues most excellent. In London prices have declined from last week, spot being quoted to-day at £64 10s., futures at £64 12s. 6d., and Best Selected is held at £69 10s.

Spelter.—This metal is weak, and there is very little business either in this market or in St. Louis. Prices for spot and May are 5.45c. to 5.55c. In St. Louis the prices are unchanged at 5.30c., and in London there is no change, to-day's closing cables being £23 12s. 9d. The shipments from the St. Louis district since January 1 aggregate 1,223,000 slabs, as against 1,192,000 during the corresponding period of last year.

Pig Lead.—The market is easier in tone, but prices remain unchanged from last week at 4.50c. to 4.60c. The American Smelting & Refining Company continues to quote shipments of Lead in 50 tons at 4.50c. In St. Louis the market is nominally quoted at 4.40c., and in London a slight decline is noted, to-day's closing price being £12 15s. The shipments from the St. Louis district since January 1 aggregate 428,000 tons, as against 552,000 during the corresponding period last year.

Antimony.—This metal continues scarce and has advanced, the quotations in some cases being purely nominal. To-day's quotations for Hallett's are 8.87½c. to 9.25c, Cookson's 8.87½c. to 9.12½c. and other grades 8.50c. to 9c.

Quicksilver.—The market is unchanged, flasks of 75 lbs. being quoted at $38. In London Rothschild's price is £7 7s. 6d.

Nickel.—The market is quiet and prices remain unchanged, large lots being quoted at 40c. to 45c. and smaller at 50c. to 60c.

Tin Plate.—There is an accumulation of Plates at the mills, which is common at this season of the year in preparation for the demands expected to be made by the canning trade, but there is no evidence of any concessions in prices. The American Sheet & Tin Plate Company continues to quote 14 x 20 100-lb. Coke Plates at $3.74 a box, f.o.b. New York, and $3.55, f.o.b. Pittsburgh. In Swansea Plates are unchanged, being quoted at 11s. 7½d.

The Machinery Trade.

NEW YORK, May 24, 1905.

The week under review has been productive of a few good sized orders, but otherwise there has been no material change in general conditions, which continue very satisfactory. Some of the railroads have been placing small orders, while one or two other industries, including the American Smelting & Refining Company, have made larger purchases.

The Rapid Transit Commission last week rejected the proposition to construct a moving platform crosstown subway in Thirty-fourth street, and instead adopted elaborate plans for a four-track subway and tunnel extending under the East River from Manhattan to Long Island City. The plans for the crosstown tunnel and subway show that it is proposed to build a line from Eleventh avenue in Manhattan to Jackson avenue and Fifth street in Long Island City. The road will have four tracks in New York and two under the river. As proposed in the plans the subway will be offered to bidders for contracts in three sections. One section will extend from Eleventh avenue in Manhattan to Ninth avenue, the second from Ninth avenue east to the East River and the third section will be the tunnel under the river. The river section will extend under private property to the East River at Thirty-fifth street and in the Borough of Queens will run under Borden avenue to the yards of the Long Island Railroad. It is understood that the Metropolitan interests are deeply interested in the plans.

Extensive Addition to Erie's Shops and Equipment.

By far the most important development of the week and the largest in the immediate vicinity of New York for many months is the official announcement of the Erie Railroad Company to the effect that it will practically double the capacity of many of its shops on its entire main line and install additional equipment aggregating in value over $300,000. In view of the fact that the company sent out a $100,000 machine tool list about three weeks ago this announcement is of especial interest to the machine tool trade, which has not only sent in its estimates, but in many cases has been asked to give special prices on several additional machines similar to the ones specified. From this it is inferred that orders will shortly be placed for a much greater amount of machinery than that covered by the list. In planning the improvements the company has given particular attention to the use of high speed tool steel and has provided liberally for the purchase of the necessary heavy machinery; in fact, a major portion of the orders to be placed will be for such machines. An appropriation of $145,225 has already been made for fitting the shops with new iron working tools of improved heavy pattern suitable for the working of high speed tool steel. Of the considerable expenditures to be made for the installation of new machine tools are $80,000 at the Meadville shops, $46,000 at the Huntington shops, $40,000 at the Cleveland shops, $34,000 at the Galion shops and about $30,000 at Dunmore and Buffalo. New tools will also be put in the shops at Bergen, N. J.; Port Jervis, N. Y.; Rochester, N. Y.; Bradford, Pa.; Salamanca, N. Y.; Kent, Ohio; Marion, Ohio, and Hammond, Ind. At its Hornellsville shops a new power plant is to be installed. Arrangements have been made for the yards and shops at all the points mentioned to be lighted by electricity, and at nearly all the Sturtevant system of heating and ventilation is to be put in. New coal and ash handling plants will also be installed.

While the plans for extensions to the Erie shops have not all been worked out in detail, they provide generally for doubling the capacities for locomotive repairs. At Hornellsville, N. Y., a new fitting up shop is to be built, new power plant and other buildings erected sufficient to care for 25 locomotives instead of ten as at present. The capacity of the Meadville shops is to be increased from 20 to 25 locomotives by the erection of several new buildings, including a machine shop, tin and pipe shop, air brake shop and boiler house. The roundhouse at that point is also to be increased to 22 stalls. The improvements to the Marion shops will consist of a new ten-stall roundhouse, turntable, machine shop and boiler room, 48 x 96 feet; sand house, storehouse, tool house, oil house and office. The Galion shops, which have a capacity for four, are to be enlarged so as to be capable of taking care of nine locomotives. A new fitting shop, 65 x 80 feet; tank shop, 64 x 80 feet; oil house, 45 x 60 feet, and other buildings not yet decided upon are to be erected. There will be constructed at Cleveland a new machine shop, 105 x 109 feet; blacksmith shop, 33 x 36 feet; oil and paint shop, 40 x 60 feet. The capacity of five locomotives will be doubled. At Huntington, Ind., the locomotive capacity of five will be increased to ten, and a new machine and boiler shop, 80 x 112 feet; power plant, 75 x 75 feet, and tool shop will be erected. Other improvements are as follows: Buffalo, N. Y., locomotive capacity increased from one to four, roundhouse capacity increased to 21 engines and new turntable to be constructed; Elmira, N. Y., six new stalls to be added to roundhouse; Port Jervis, N. Y., new 15-stall roundhouse to be erected; Bradford, Pa., new six-stall roundhouse to be built; Kent, Ohio, 14-stall engine-house to be erected; Hammond, Ind., ten-stall roundhouse to be erected, with small machine shops and boiler room; capacity of Dunmore shops to be increased from four to six locomotives. At all these various shops the roundhouse stalls will be extended to a uniform depth of 95 feet and new 80-foot turntables will also be installed. These improvements will not only increase the total capacity of the shops from 85 to 127 locomotives a month, but will permit the company to handle the new locomotives being installed at any point.

Needs of Other Railroads.

The bids of the manufacturers on the list of equipment upon which the purchasing department of the Pennsylvania Railroad Company has been making inquiries during the last few weeks are under consideration. Until the tools and machinery have been thoroughly investigated and discussed with their practical people the purchasing department will not close the business. The entire list for the year's requirements has not been exhausted, however, and the following tools will be open for bids during the ensuing week: One double punch and shears having 42-inch throat, with capacity for punching 3-inch holes in ½-inch plate and to shear ⅞-inch plates; one 2½-inch double bolt cutter, one automatic nut tapper to tap nuts up to 1¼ inches one 1-inch pointing machine, one 12 inch by 6 foot engine lathe without tapering attachment, one 1200-pound steam hammer, one portable pipe threading machine, one 350-ton hydraulic driving wheel press.

A good sized lot of machinery is being purchased by the St. Louis & Iron Mountain Railroad for equipping its shops at Baring Crossing, Ark. The orders are being placed through Westinghouse, Church, Kerr & Co., New York, which has purchased among other machinery air compressors from the Chicago Pneumatic Tool Company.

We understand that improvements are to be made to the shops of the Southern Indiana Railway Company at Bedford, Ill. The shops, which are already extensive, will be considerably enlarged, a new foundry will be built adjoining and new and improved machinery will be added.

The representatives of the Great Central Railway of England, who spent several days in New York after attending the International Railway Congress at Washington, have returned to Great Britain, taking with them much data regarding American machinery, and especially railway appliances. Before leaving, the party, which consisted of J. Ristern, assistant general manager of the company; E. W. Clear, assistant freight manager; J. Rowlandson, assistant engineer, and W. Clow, assistant superintendent, placed an order with William Sellers & Co., Philadelphia, for tools. The order was sufficiently large to attract the attention of machinery men and as a result the Englishmen were furnished with much material in the way of catalogues descriptive of American goods. It is highly probable that more orders will be placed with American manufacturers as a result of the party's trip and investigations. While in New York the railroad representatives made their headquarters with Fred. Patman, American representative of the company, who has offices at 1 Broadway. During their stay in this country they visited Chicago, St. Louis, Baltimore, Philadelphia and several Canadian cities, where they studied general business methods of American railroads and paid particular attention to track construction, signaling and the like. It is probable that the congress, which was largely attended by foreign railroad men, will have a decided effect on the exports of American machinery used in connection with railroads, and it is not improbable that some large sales of American goods to foreign companies will soon be recorded.

Important Machinery Requirements.

Large purchases of machinery have recently been made by the Iron Clad Mfg. Company, with main offices and works at 204-206 Varet street, Brooklyn, N. Y., for replacing the tools which were lost in the recent fire which destroyed a large part of its plant. Only a portion of the machine tool equipment, however, has thus far been purchased, and the company is now in the market for drawing and cutting presses, index punches, shears, rolls, horn presses, lathes, double seamers and other machinery used in the manufacture of sheet metal goods. All the machinery will be electrically driven and the welding will be done entirely by electricity, as the company controls the patents in the United States for electric welding on everything in its line of manufacture. The company has already rebuilt the greater part of its plant, which was destroyed, and has plans prepared for additional buildings. The new buildings, which will be very much larger than the old ones, will be fire proof and constructed of brick and stone. When the buildings are completed the company will have floor space in excess of that which it formerly had of 500,000 square feet. In addition to rebuilding the burned district the company has also acquired a plot of ground on Cook street toward Bushwick avenue, 200 x 250 feet, and has let contract for a fire proof brick and stone

building to be constructed on this plot. This new building is expected to be ready for occupancy by July 1. Interests associated with the company have purchased the Maryland Stamping Company, Baltimore, Md., whose plant it intends to enlarge very materially, for which a good sized piece of property adjoining has already been acquired. At this plant a new building, 105 x 250 feet, has been erected and will be occupied this week. It is one continuous building connected with the old Maryland stamping plant, the whole covering the entire front of Bush street extending from Wicomico to Sassafras street. An addition will shortly be built over the balance of the block which will make a complete building about 300 feet square. A side track has been built through the entire property so that cars can be loaded and unloaded in the building. With its new Baltimore factory and its large Brooklyn factory the company's present facilities will be more than doubled, and when the improvements now under way are finished it will have one of the most up to date and modern plants of its kind in the world.

Extensive additions are to be made to the plant of the Hay Foundry & Iron Works, Newark, N. J., to meet the increasing demands made upon that company for its output, and before next fall the already large plant will be augmented by a new structural shop, 130 x 400 feet; templet shop, 40 x 100 feet, and a power house, 42 x 110 feet. The company intends to build on either end of the structural shop steel runways, each of which will be 60 x 450 feet. The structural shop is to be equipped with machinery capable of doing the heaviest kind of work, and its daily output will be very large. The shop will be fitted with two 25-ton cranes and 12 wall cranes for feeding the machines. The cranes will be constructed by the Morgan Engineering Company, Alliance, Ohio, especially for the kind of work to be done in the structural shop. The other tools will comprise the latest tools for the fabrication of structural steel, and the list includes angle shears, gate shears, multiple rolls, straightening rolls, punches, rotary planers and bending machines. Most of these tools have been ordered from the Cleveland Punch & Shear Works Company, Cleveland, Ohio. The power plant equipment, which has not been entirely decided upon as yet, will consist of 600 horse-power of boilers and an engine of 500 horse-power of the Corliss type with about 400-kw. generators. The air compressor will be of the Ingersoll-Sergeant Corliss type. J. L. Hay, who is at the company's New York office, 141 Broadway, has the details of construction and equipment of the building in charge, and it is his plan to have the work rushed to completion so that the additions will be in working order by next fall at least. It is probable that the power plant will be doubled in the near future, as the provisions now being made will just about cope with the company's present business conditions and the demands upon its resources are rapidly growing.

The Henry-Bonnard Bronze Company, which has for many years occupied the building at 430-436 West Sixteenth street, New York, will shortly erect a new plant at Mt. Vernon, N. Y., which, it is said, will be the largest bronze casting establishment in the world. Eugene F. Aucaigne, who is managing director of the foundry, has the details of construction and equipment of the new plant in charge, and, according to the present plans, it will consist of two one-story brick buildings, covering a little more than 2 acres. It is proposed to have the establishment erected and equipped before the summer is over. The buildings will be divided into an office, showrooms, foundry, finishing department and power plant. The foundry and finishing rooms will be equipped with six or more cranes, two of which will be of from 20 to 25 tons capacity, and the others will be 10-ton cranes. All of them will be used to handle the heavy bronze castings. There will also be required lathes, air compressors, drill presses and the like. The power plant will be about 200 horse-power and all of the machines will be electrically driven. The work of the company will not be interrupted and most of the equipment for the new establishment will be new. The Henry-Bonnard Company was established in 1872 and it has turned out some of the largest bronze castings ever seen. It is already the largest of its kind on the Western Hemisphere.

The Brooks Locomotive Works at Dunkirk, N. Y., which is one of the subsidiary companies of the American Locomotive Company, 111 Broadway, New York, will shortly erect a large foundry. The plans for the structure have been prepared and they show that the main building will be 175 x 650 feet. The plant will in many respects be a reproduction of the foundry built about two years ago by the American Locomotive Company at Schenectady, N. Y. The details of the construction were arranged at the Dunkirk offices and sent to the main offices of the company, where they were recently passed upon. The purchasing of machinery will be done from the Dunkirk shops, and it is understood that specifications have been prepared calling for a large list of machines to be installed in the new plant. It is understood that the present foundry of the company, which is much smaller than the contemplated structure, will be abandoned and used for other purposes, but the details in that respect have not been announced as yet. Work on the new foundry will be begun shortly and it is expected that it will be built and equipped during the coming summer.

The stove works of Hunt & Miller at Hudson, N. Y., have been purchased by Jason C. Moore of New York, who is president of the Moore-Texas Rice & Canal Company. Mr. Moore has offices in the Hanover Bank Building, at Nassau and Wall streets, and his purchase has no connection with the Moore-Texas Rice & Canal Company. It is understood that the purchaser intends to form a company and enter into the manufacture of copper articles and fittings, including copper boilers for water heating and other purposes. In order to carry out those plans the plant will have to be remodeled in a measure and considerable new machinery will undoubtedly be installed. Nothing will be done toward consummating the scheme for a time, as Mr. Moore intends to be away from the city for a little while. He will not consider the purchasing of machinery for the new venture until his return, and it will be several weeks before anything will be done in that respect. Beyond the fact that the line of manufacture at the factory will be materially changed and its output increased, no details of the scope of the proposed company or who are interested with Mr. Moore will be given out for a time.

E. F. Rate & Sons, Iowa City, Iowa, expect to engage in the manufacture of paper bags in large quantities to be used in connection with a scheme to advertise their glove and mitten manufactory. They are in the market for machinery and sheet and aluminum covered plate novelties.

D. Sortman, Connersville, Ind., is in the market for machines for the manufacture of wire nails as well as machines for making pins and hooks and eyes.

John J. Mims, Reidsville, Pa., expects to purchase machinery shortly for equipping an ice plant and he wishes to get into communication with those who can furnish him with the necessary equipment.

The Green Fuel Economizer Company, 74 Cortlandt street, New York, maker of the well-known Green fuel economizer, announces that it is now prepared to execute orders for steep plate fans, blowers, exhausters, heaters, &c., for all purposes. The fans are made to standard designs and dimensions, but the company will be pleased to build special fans to suit special conditions. The new shop of the company at Matteawan, N. Y., specially erected and equipped with the latest machine tools to turn out the work economically, is now completed and running. The company maintains branch offices at Boston, Chicago, Atlanta, Montreal, San Francisco, Salt Lake City, Seattle and Los Angeles.

The H. A. Rogers Company, 19 John street, New York, has recently ordered several carloads of machine tools from Cincinnati concerns, to be installed at the Garfield plant of the American Smelting & Refining Company, Garfield, Utah. The Rogers Company reports that it has some promising inquiries for its machinery department.

Dodge & Day, engineers and architects, Philadelphia, Pa., have been commissioned by Wm. Knabe & Co., Baltimore, Md., to take entire charge of extensive improvements to their piano plant. The operation includes a new five-story building, 225 x 50 feet; new dry kiln and wood mill, as well as numerous changes to the present buildings. There will be also be a new power plant, which will involve the purchase of a new engine and generator. Motors will be installed, and considerable electrical work done, as it is the intention to operate the plant electrically throughout.

Business Changes.

The Westinghouse Machine Company has recently announced substantial extensions in its sales organization for covering Southern and Western territories. In addition to the original New York, Boston, Pittsburgh and Chicago offices, new branches have been established at Cincinnati, Denver, San Francisco, Charlotte, N. C., and Atlanta, Ga. With these added facilities the extensive mining territory of the West and cotton industries of the South may receive more active attention. The representative offices of the company are now as follows: New York, 10 Bridge street, in charge of L. L. Brinsmade; Boston, 131 State street, E. L. Clarke; Pittsburgh, Westinghouse Building, William Bradford; Chicago, 171 La Salle street, John B. Allan; Cincinnati, 1111 Traction Building, A. A. Brown; Denver, 512 McPhee Building, C. C. Chappelle; Charlotte, N. C., South Tryon street, Stuart W. Cramer; Atlanta, Ga., Equitable Building, Stuart W. Cramer; Philadelphia, Stephen Girard Building, M. R. Muckle, Jr., & Co.; San Francisco, 614 Mission street, Hunt, Mirk & Co.

Wickes Brothers, New York, Pittsburgh, and Saginaw, Mich., builders of punches, shears, bending rolls and boiler makers' tools and dealers in engines and boilers, whose works are at Saginaw, Mich., have established the general office of the machine building department in the Empire Building, Pittsburgh, in charge of David F. Turnbull, formerly with the New York office of the company.

Catalogues Wanted.—The General Building Supply Agency, Rome, Ga., desires to receive general building supply catalogues, &c.

New England Machinery Market.

WORCESTER, MASS., May 23, 1905.

An interesting event of the week in machinery circles was the action Monday of the directors of the Kitson Machinery Company, Lowell, Mass., manufacturer of textile machinery, in recommending the stockholders of the company to sell their holdings to the Lowell Machine Shops, an action which is considered equivalent to a sale. The Kitson Company recently acquired control of the Atherton Mfg. Company, Pawtucket, R. I., so the sale to the Lowell Machine Shops is practically merging three companies. The merger really goes farther than that, for the control of the Lowell Machine Shops recently passed into the hands of Robert F. Herrick, a Boston lawyer, representing interests identical with the Saco & Pettee Machine Shops, Newton Upper Falls, Mass. No authoritative statement can be obtained as to the next step in bringing together important cotton machinery interests. Rumors have been afloat for some time, as already stated in this column, bringing in the names of the Whitin Machine Company, Whitinsville, Mass., and the Draper Machine Company, Hopedale, Mass. The Howard & Bullough American Machine Company, Limited, Pawtucket, R. I., is said to have reached an understanding with the Lowell Machine Shops which will mean the cooperation of formerly competing interests. If the merger goes beyond the point where known facts end the effect upon the cotton machinery industry will be a very important one, for the companies named are each individually large and strong, and to combine them would mean the consolidation of millions of dollars of invested capital and the employment of thousands of workmen under a single general management. It is announced that the Lowell Machine Shops, Kitson Machine Company and the Atherton Mfg. Company will continue to operate under individual management.

The Boston machinery dealers have during the week brought to a focus a number of orders which have been pending for a long time. Otherwise the general condition of business remains unchanged.

The machinery trade is greatly interested in the creation of a new office by the New York, New Haven & Hartford Railroad Company, that of construction engineer in charge of shop construction and equipment. The appointee is F. K. Irwin and his office will be in Boston. Mr. Irwin was until recently assistant engineer of the Union Pacific Railroad, in charge of shop construction, with headquarters at Omaha. He had charge of important shop improvements for the Union Pacific.

Railroad and Industrial Expansion.

The New York, New Haven & Hartford Railroad is making general plans for a very large increase in its machine shop facilities. The plans are, however, entirely tentative at the present time, and it will be some time before a decision is made as to whether or not they will be carried out this year, and if they are where they will be located. The idea goes farther than repair shops it is said. The company looks to the time when it will build a part of its rolling stock. These statements are not authoritative, though there is no secret of the need of greater shop capacity. When the time comes, and it may be before this season is ended, very large purchases of machine tools and other equipment, including power, will have to be made. The shops will doubtless be of the most modern type in all their details of equipment.

One of the most important of the shop additions announced in this section of the country this spring will be that of the Underwood Typewriter Company, Hartford, Conn., which will increase its floor area from 130,000 to 300,000 square feet, and the improvement carries with it the intention to increase the number of employees from 1100 to 2000. The main building of the additions will be 50 x 400 feet and five stories. Connecting this building with the present main factory will be two wings, each 50 x 150 feet and five stories. The material will be brick. The roofs of the new buildings will contain broad skylights pitched to the north, to afford the best of light for the general assembling department, which will be located on the upper floor. A new 500 horse-power engine will provide additional power for general manufacturing purposes, and a 400 horse-power engine and generator for lighting and other purposes of electricity will be installed. A gas generating plant will be included in the plan of improvements, to provide gas for japanning, case hardening, brazing, &c. Plunger elevators will be installed. The plan includes important changes in the present buildings. The company states that much of the question of new equipment has already been settled.

F. H. Schiefner has been elected treasurer of the Meisel Press & Mfg. Company, Boston, which does a general gear cutting business as well as manufacturing printing presses.

James W. Weir, manufacturer of special machinery, rubber molds, &c., who has for some time past been located at 232 Stratford avenue, Bridgeport, Conn., will, on June 1, remove to more commodious quarters at 155-165 Housatonic avenue, where he will have about three times the floor space that he has had on Stratford avenue. He has already ordered a Jacobson 7 horse-power gas engine, and states that he will require a little new equipment in the line of a lathe, milling machine, &c.

The manufacturers of cotton machinery of all descriptions have advanced prices during the past few weeks. The demand for this class of machinery has increased very materially, owing to the present prosperous condition of the cotton manufacturing business, which is one reason for the advance. Another reason is that the price of raw materials has advanced to such an extent that an increase in prices was necessary. There has been no uniform increase, the amount varying up to 25 per cent. in extreme instances.

It seems to be certain that a subway will be built in the near future connecting Cambridge with Boston. At the present time there is a difference of opinion as to how large a tunnel shall be built. There are many advocates of a subway capable of taking four tracks, and a bill to effect such a culmination of the plan has been introduced into the Massachusetts Legislature. This bill calls for the construction of the subway by the Boston Elevated Railroad Company, which operates the elevated as well as the surface lines of Boston.

The National Folding Box & Paper Company, New Haven, Conn., has let the contract for its large plant, which will consolidate the company's business under one roof, as has been stated in *The Iron Age*. The building will be four stories, in the form of a hollow square, having frontages of 215, 207, 362 and 333 feet, with an open court 50 x 200 feet in the center. In this court will be located a power house, 40 x 70 feet, in which engines and generators will be installed to provide electric power for operating the plant in electric units. The cost of the plant will be about $150,000.

The Common Council of the city of Providence, R. I., has voted to appropriate $150,000 for the enlarging and equipping of the Technical High School Building. It is understood that a considerable amount of machine and other similar equipment will be required later.

The Charlestown Navy Yard will ask for an allotment of $250,000 for carrying out the plan of consolidating the power plants of the yard, under specifications furnished by Stone & Webster, engineers, Boston, who have made a thorough investigation of the matter. A good deal of this work has already been accomplished. The purpose is to give the central power station sufficient capacity in electric power, compressed air and heating not only to provide for the demands of the yard itself but for any ships that may be tied up at the docks or in dry dock, which latter demand has increased greatly of late and promises to be even greater when the new dry dock is in operation. In addition to power equipment already ordered it is recommended that a large steam turbine and generator be installed later.

The New England Enameling Company, Middletown, Conn., is to erect an addition to its works, 100 x 150 feet and two stories, to be devoted to manufacturing and storage. The company manufactures the Ideal enameled steel wares and tin and galvanized wares.

The McLagon Foundry, New Haven, Conn., is rebuilding one of its buildings and replacing old buildings with a modern structure, 80 x 150 feet. A 10-ton traveling crane will be installed, together with new core ovens, tumbling barrels and other foundry appliances. The capacity of the company's works will be increased 50 per cent.

The North & Judd Mfg. Company, New Britain, Conn., manufacturer of hardware, is to make extensive improvements to its plant. A five-story addition, 50 x 156 feet, will be erected to provide for the overflow of manufacturing departments. A foundry building, which has been used as a kiln department, will be remodeled for a molding room, and the kilns will be located in a building recently erected for the purpose. The improvement will considerably increase the capacity of the already large works.

The Leominster Comb Company, Leominster, Mass., is planning to build what is said to be the largest hot pressing house in the world, the building to be 50 x 170 feet, part one story and the remainder two stories. The company will need a 75 horse-power engine and a 100 horse-power boiler. The new building will be for the manufacture of pressed horn and hoof goods. Later on a larger building will be erected for the manufacture of horn hair pins.

The Eaton, Cole & Burnham Company, Bridgeport, Conn., has purchased a 300 horse-power Babcock & Wilcox boiler and two Erie Ball engines direct connected to 150-kw. Westinghouse generators, for a new power house, 40 x 80 feet, which is about to be erected.

The Union Twist Drill Company, recently organized by men prominent in the twist drill business and which took over the plant of Gay & Ward, Athol, Mass., contemplates building an addition to the plant, 60 x 180 feet, to be used as smith shop, hardening and stock room. Specifications for the new equipment that will probably be required have not yet been prepared.

Chicago Machinery Market.

CHICAGO, ILL., May 23, 1905.

Business is good in spots and bad in spots, the general average being a fair volume. Prices, however, are very well maintained and what business is being placed is going at a profit to both manufacturers and dealers. Exceptionally heavy demands are being made upon boiler shops, and as a result of their large sales of boilers they are also very considerable purchasers of boiler shop tools. Gas engines, steam engines and electrical generators, motors, dynamos, &c., are in good demand.

Illinois Central Machine Tool List.

The Illinois Central list, which closed this week, includes the following tools, the total value being close to $100,000: One Gisholt turret lathe, 6¼-inch bore; one journal turning lathe, one 42-inch steel tired wheel lathe, twelve 16-inch stud lathes, three 24-inch engine lathes, two Fox Monitor brass lathes, one 90-inch driving wheel lathe, with quartering attachment; one 16-inch tool room lathe, four 21 x 24 inch flat tired lathes, two 30-inch engine lathes, 7 inches between centers; four 16-inch lathes, two double axle lathes, one 2-inch turret automatic screw machine, two 2-inch plain automatic screw machines, one 42-inch vertical boring machine, with turret head; three 34-inch vertical boring mills, with two heads; one 2½-inch heavy boring machine, one car wheel boring machine, five 42-inch vertical drill presses, four friction drill presses, ½-inch holes; one six-spindle flue sheet and mud ring drill, two 36 x 36 inch x 12-foot planers, one 48 x 48 inch x 12-foot planer, twelve 26-inch crank shapers, two universal milling machines, six rotary valve seat facing machines, five No. 4 Morse & Dexter valve reseating machines, one 60-inch water guide grinder, two universal tool grinding machines, one dry emery grinder, three wet emery wheels, three portable cylinder borers, two drill grinding machines, one wheel shifting press, five double centering machines, five 4-inch pipe cutting machines, one 96-inch tin shearing machine, one stamping machine, 2 to 8 inch holes; one metal cut off saw, three 2-inch Acme bolt cutters, one 1½-inch Acme bolt cutter, one 1500-pound single frame steam hammer, one 2500-pound single frame steam hammer, one scroll saw, two chisel mortisers, one automatic rip saw, four friction drill presses, ½-inch holes; one Acme two-spindle stay bolt cutter, one Pridmore brake shoe molding machine, one hydraulic riveter, 17 feet 6 inches gap; one pressure accumulator, 10 inches x 15 feet; one hydraulic pump, 20-inch steam cylinder and 4-inch water cylinder; one portable mud ring riveter, 15-inch throat, 75 tons pressure per square foot; one rotary bevel shear, with motor; one rotary splitting shear, with motor; two Fergusson flue welders, one large annealing furnace, one universal hydraulic flanging press, one electric crane, two 30-ton hoists, 78 feet span; one 10-ton electric crane, 38 feet span; one 33-ton crane for riveting tower, 25 feet span, 48 feet hoist. A good deal of this equipment is required for enlargement in the shops at Burnside, Chicago. Bids closed May 17, but awards have not yet been made.

Manning, Maxwell & Moore, Chicago office, report that they secured the greater part of the large Union Pacific order for machine tools, the order given to them amounting to about $35,000. The sale included heavy Hilles & Jones punches and shears, Gridley automatic lathes, Gisholt turret lathes, Berlin sanding machines and Kennedy heavy forging machines. Omaha delivery is specified, but it is thought that these tools will be distributed at various points along the line. The same firm sold to the Illinois Steel Company for delivery at Chicago two heavy Hilles & Jones double angle shears, the same as are in use at the Carnegie works, and Hilles & Jones 10-foot plate bending rolls for the Butte Copper Mining Company, Butte, Mont.

The Elgin, Joliet & Eastern Railroad has received bids on a heavy riveter and flange press for the Joliet shops, and the Chicago, Lake Shore & Eastern has also received figures on a hydraulic equipment. Lists have been received in this market from the Erie road for quite a large machine equipment, but it is pretty well understood that this business will be placed in New York.

The new power house and plant of the Chicago Southern Traction Company, mentioned some weeks ago, is to be located at Riverdale on the banks of the Calumet River. The proposition, however, is still in a formative stage, awaiting the return of the president of the company from Europe. John E. Youngberg, architect, 218 La Salle street, Chicago, has drawn preliminary plans for power house, barns, shops and other structures.

The Indiana Harbor Railway Company, owned mainly by the syndicate which owns Indiana Harbor and East Chicago, Ind., will connect these manufacturing centers with the coal fields in and about Danville, Ill. It will be largely a freight road, double track, 117 miles in length. Concrete bridges and very solid roadbeds will characterize its construction. McArthur Brothers, Chicago, have the contract for the first 50 miles out of Danville; Winston Brothers, Minneapolis, have the next 50 miles, and the Knickerbocker Ice Company, Chicago, have the last 17 miles. Shops will be erected somewhere along the route, probably at Indiana Harbor, but the location has not yet been announced. C. W. Hotchkiss is president and W. A. Sumner chief engineer, La Salle street station, Chicago.

The Urie Boiler & Machine Company, Kansas City, Mo., is making large additions to its plant. The main building will be 105 x 205 feet, and will be equipped with one 5-ton and one 10-ton traveling crane. A foundry, 50 x 75 feet, and an erecting shop, 75 x 150 feet, will also be added to the plant. Steam power will be used throughout the plant, according to present plans. The new plant will be devoted to the manufacture of the Urie patent boiler, as well as mining dredges and general contracting machinery.

The Iowa Fence & Wire Works Company is the name of a new corporation organized at Carroll, Iowa, with a capital of $100,000. A patented woven fence will be manufactured. A sample fence weaving machine is now being built, and others will be contracted for, to be made from drawings and patterns furnished by the company. A factory is to be erected at Carroll and a complete new equipment installed. Machinery will be driven by electric motors of 5 to 10 horsepower each.

John Wunder, Minneapolis, Minn., has been awarded a contract for the construction of the Washburn-Crosby Company's new machine shop at Minneapolis. The building will be five stories, 60 x 80 feet, and is to be made thoroughly fire proof by using metal frames, doors and wire glass, in addition to the reinforced concrete. Modern machinery is to be installed, with electric motors attached, and one 10-ton electric traveling crane.

The Anderson & Winter Mfg. Company, Clinton, Iowa, has had plans prepared for a three-story furniture factory, 130 x 104 feet. A 72-inch x 16-foot tubular boiler and a 14 x 42 inch Corliss engine will be installed.

The C. L. Packard Machinery Company, Chicago, is having its store at Canal and Washington streets remodeled. A glass front and side which are being put in will give the firm exceptionally fine means for displaying its stock.

Municipal and Power Work.

The new Borland Building, Chicago, of which Shepley, Rutan & Coolidge, Boston and Chicago, are the architects, will embody the most modern ideas of construction and will combine art with utility. Plans call for a building more than usually solid and substantial. From 1500 to 1900 tons of structural steel will be used, in spite of the fact that the area of the building is only 46 x 94 feet and its hight 18 stories. The power plant of the building will call for three 150 horse-power high pressure water tube boilers for heating purposes, and if it is decided to install a power plant for elevators, electric light, &c., a much larger capacity will be required. About 365 horse-power will be required for the elevators, and whether this will be in the shape of a motor attached to the Edison circuit or not has not yet been decided. The power plant will also include pumps, light dynamos and the ordinary accessories of an engine room of this kind.

The new Hotel Brevoort, Chicago, which is being built for Hannah & Hogg, on Madison street near La Salle, will be a 13-story structure, 50 x 175 feet, and will cost $500,000, exclusive of machinery and furnishing. The William Grace Company has the general contract, which involves 1500 tons of structural steel. This firm will sublet the contracts for power, heating, plumbing, &c. The power plant will include three 150 horse-power water tube boilers, two 100-kw. and one 75-kw. generators, three passenger and one freight elevators, besides the usual accessories of a plant of this kind. Egan & Prindeville, Chicago, are the architects.

The Royal Tailors, a Chicago corporation, is having built for it a new warehouse and factory at Fifth avenue and Polk street. The building is seven stories in hight, 100 x 116 feet, and will cost $200,000. Wm. Adams & Co., 145 La Salle street, have the general contract and Jarvis Hunt is the architect. Five hundred tons of structural steel are required to erect the building. Power for the plant will be furnished from the Edison circuit. A boiler plant sufficient for heating will be installed, but specifications for boilers, motors and other machinery are not yet prepared.

Improvements which the Singer Mfg. Company is making at its Cairo (Ill.) sewing machine plant are almost completed. Machinery being installed includes a 1000 horsepower engine, built special by the McIntosh-Seymour Company, Auburn, N. Y., and electrical machinery from the shops of the Diehl Electrical Mfg. Company, Elizabeth, N. J., consisting of two new 250-kw. generators of 240 volts, three 125 horse-power motors, one 75 and one 30 horsepower motor. The generators will be direct connected with the engine. The improvements, including new building and equipment, represent an expenditure of over $50,000 and will greatly increase the facilities of the plant.

Bids which were to have been opened May 2 for furnishing four internally fired boilers, 250 horse-power each, for the City Hall, Chicago, are in the hands of the Commissioner of Public Works, but an injunction of John Mohr & Sons forbid the opening of bids or awarding of contracts. The same firm of boiler manufacturers is also holding up

the bids on boilers in several of the water works pumping stations by injunction.

The city clerk of Alma, Neb., is asking bids on machinery for the electric light plant and water works system, including two 60-inch by 14-foot return flue tubular boilers, one 150 horse-power heater, one 60 horse-power high speed engine, a 40-kw. dynamo, pumps, valves and necessary accessories. Bids must be in by June 8.

The city of Whittier, Cal., will receive bids until June 12 for furnishing the following machinery: One horizontal six-cylinder duplex steam pump of 1400 gallons capacity, of the double acting type; two water tube boilers of 150 horse-power each; one duplex air compressor for raising 3,000,000 gallons 45 feet every 24 hours; one boiler feed pump and one oil set for boiler feed. An alternative bid will also be taken on a pumping engine of 1400 gallons capacity of a horizontal cross compound type. E. C. Butterfield is city clerk.

The Connersville Light, Heat & Power Company, Connersville, Ind., has been organized with a capital stock of $100,000, and will build a light, heat and water system to supply the city.

The Murray Iron Works Company, Burlington, Iowa, reports among recent shipments of Corliss engines the following: One 100 horse-power to Woonsocket, R. I.; two 200 horse-power compound to the municipal light plant at Lincoln, Neb.; one 300 horse-power to Riverside, N. J.; one 400 horse-power and one 200 horse-power for the new municipal light plant at Winfield, Kan.; two 200 horse-power compound for California irrigating plants, one 150 horse-power for a Chicago electrical factory, one 500 horse-power for a rolling mill in Seattle, Wash.; one 600 horse-power for a saw mill in Idaho, one 600 horse-power for an electric light plant in New Mexico, one 150 horse-power for Norristown, Pa.; one 150 horse-power for a Missouri flour mill, one 150 horse-power for a Philadelphia woolen mill, one 200 horse-power for a Montana mine, one 50 horse-power for an ice factory in Canada, two 50 horse-power for flour mills in Mexico.

Business Changes.

Cavanaugh & Darley, Chicago, dealers in gas engines and machinery, have moved from 34 West Randolph street to 21, 23 and 25 Plymouth court, near Jackson Boulevard.

Philadelphia Machinery Market.

PHILADELPHIA, PA., May 23, 1905.

There is a little better feeling in the local machinery trade. While immediate purchases have not materially increased, the tone of the market is decidedly improved. A fair volume of business continues to be transacted in nearly all branches of the trade, and it is generally anticipated that this will be largely increased in the near future. Inquiries on all lines have been more numerous and appear to have increased steadily during the past week or so. There is also a disposition to close up business more promptly than heretofore. Some manufacturers have taken on quite a lot of additional business, but the greater portion could still handle more without serious inconvenience. It must not be overlooked, however, that our capacity for producing machinery and tools has increased largely over that of a few years ago and while the demand at this time does not seem particularly heavy the same volume of business offered some years previously would have taxed plants far beyond their capacity at that time. To keep these largely increased plants as busy as they were during the boom days of 1902-1903 would require a vast amount of new business, which under the present combination of circumstances is not likely to develop in the immediate future. A number of reasons are advanced as to the cause of the recent lull in what might be termed big propositions, the apparent inactivity in the iron market, the agitation as to railway legislation, the prospective crop situation and the unfavorable condition of the security market being mentioned among others. In some cases these factors have no doubt played a part, but there is a large amount of business being transacted nevertheless. The pace at which some plants have been operated has brought quite a demand for machinery and tools for replacement. The railroads, while they are not placing orders in large quantities, are taking on quite a lot of tools, largely for renewal and extension, and manufacturing plants here and there are adding to their equipment, while on the whole quite a good general business is being transacted.

The builders of heavy engines, cranes and special tools have probably taken on the greater amount of work during the recent week or so, while some of the smaller tool builders have added materially to the orders on their books.

The Philadelphia Ship Repair Company was recently incorporated under Pennsylvania laws with $200,000 capital, all paid in. It is a close corporation, F. J. McDonald, formerly connected with the Neafie & Levy Ship & Engine Building Company, being its president. In forming the company the business and plant of the Philadelphia Machine & Mfg. Company, formerly located on Laurel below Front street, was absorbed. The present site of the new company's plant is at the foot of Mifflin street, on the Delaware River, where 12½ acres of ground have been acquired. A temporary machine shop, 60 x 140 feet, has been erected and the equipment of the former Philadelphia Machine & Mfg. Company installed. A small amount of additional machinery has been purchased, but no extensive equipment will be bought until a further development of the plant takes place. In its present condition the company is able to handle repairs on vessels 225 feet long and of 17 feet draft, at low water. With the completion of additional floating dry docks, which are being built, it will be able to dock vessels up to 600 feet in length and of 25 feet draft. It is expected that the new plant will be in shape for general work in the course of a few weeks, although the machine shop is now working on orders for a number of Philadelphia steam steering engines, which will be one of the new company's specialties, and for which it already has orders.

The Harlan & Hollingsworth Corporation, Wilmington, Del., is preparing to erect a new boiler shop. The cost of the addition is estimated at about $40,000. Requirements in the line of machinery and tools have not yet been decided upon.

The Hoist Mfg. & Construction Company, a recently formed concern, is preparing to place a new spur gear hoist on the market. This it advises us will be a hoist of high efficiency with a number of new features. The company is at present busy in the various parts of its plant on a number of special automobile steam engines for which it has recently received orders and expects to make a specialty of this class of work in connection with the manufacture of hoists.

The Southwark Foundry & Machine Company has recently taken orders for a number of heavy engines, four, comprising engines and condensers for steel plants, the largest having a capacity of 3000 horse-power. It has also had a good demand for its Weiss condensers, a number of large ones being on order and in course of construction. The plant is being operated to its capacity and the outlook for increasing business is said to be very favorable.

The Pressed Steel Mfg. Company, manufacturer of Knipe patent ball bearings, is now making these bearings for shafts from ⅛ inch up to 2 inches in diameter. Orders are being received in quantity from manufacturers of vehicles, automobiles, radiating fans, trucks, trolleys, &c., covering all classes of light work. An extensive field has developed for these bearings for use in connection with electric motors, a large order being recently completed for the General Electric Company and other manufacturers.

The Hess Machine Works report a good inquiry for file making machinery, mostly, however, from foreign sources, the domestic demand being rather quiet. Recent deliveries of these machines include two sets each for parties in Germany and in England. Orders are coming in pretty freely and business conditions are considered very favorable.

Dienelt & Eisenhardt, Incorporated, continue quite active. An extensive demand has developed for their new Monarch electric motors and some good orders have been received. The demand for hydraulic jacks is increasing and that department of their plant is very busy. The general machine and foundry departments have considerable work on hand and from the volume of inquiries received it is expected that the volume of business will still further increase.

P. Hollingsworth Morris notes quite a demand for sugar making machinery, centrifugals, sand and lime brick making machinery and special machinery. All departments of the plant continue very busy, while inquiries and orders are being received in a satisfactory quantity.

The Tabor Mfg. Company, manufacturer of molding machines, has received a large number of orders during the past week and is running at full capacity in all departments. The demand comes from all sections of the country. A good increase, however, is noted particularly from the Southern States. Foreign demand continues good, recent shipments including three 13 x 20 and a 14 x 16 inch split pattern power ramming machines for export to England. Several split pattern and power squeezer machines have been shipped to parties in the Middle West for use in brass foundries. Orders for eight Draper-Tabor and 12 power ramming vibrator frame machines have been taken for installation in a large stove and heater plant, while an order for a heavy power ramming vibrator frame machine has been taken from another stove foundry. Orders for Draper-Tabor split pattern and power ramming machines for soil pipe fittings work have been taken, as have also a number of orders for small split pattern machines for use in making malleable iron fittings, &c. A large 41 x 50 inch machine is also building for a local iron foundry. The Tabor Company also reports good sales of Taylor-Newbold saws. Several 33 and 40 inch saws have just been shipped to steel foundries in the Middle West, while a 40-inch saw has been shipped to Pittsburgh parties, and several 36 and 40 inch have been ordered by local plants.

Cincinnati Machinery Market.

CINCINNATI, OHIO, May 23, 1905.

Reports as to the condition of business among local manufacturers show no special change from last week, and, judging from what we are able to learn, trade looks very satisfactory indeed. Considerable new orders have been placed during the week and builders of tools almost without exception are having all they can do. The larger sizes of tools are apparently in greater demand just at present than are the smaller, yet builders of the latter class say that trade along their lines is showing great improvement. The difficulty with the striking architectural workers is still visible, with both sides holding steady, although the structural people say that they have no difficulty in securing all the outside men they need, with most of the inside workers back at their old places.

The Industrial Bureau is in communication with a concern that manufactures drop forgings that is looking for another location. It is anxious to join with some plant already established in this city that is not averse to enlarging its scope. As there are but two drop forging plants now located here, it is safe to predict that another one would find a ready market for its output. Correspondence is also being carried on with a lawn mower concern and a gasoline engine plant from Iowa, with a view to having them locate here. There have been no developments in the automobile or steel castings plant since our last report and the matter is being held in abeyance.

Important Railroad Machine Tool Lists.

The railroads are becoming an important factor in the trade and are beginning to buy considerable machinery. The Cincinnati Southern Railway Company has let the contract for its new shops at Somerset, Ky., and the work of excavating has commenced. These buildings will be of the latest design and up to date in every particular. The buildings will consist of machine shop, power house and storage room, electrically driven, with a capacity of 11 locomotives per month. The company is now receiving bids for boilers, pumps, air compressors, transfer tables and electric cranes. It expects to remove a portion of the machinery from several of the other shops and install the same in the new plant when completed, and will also at that time be in the market for about 35 additional tools, consisting of lathes, milling machines, planers and, in fact, a complete line of new tools.

The Cincinnati, Hamilton & Dayton Railroad is in the market for additional tools for its shops at Peru, Lima and Indianapolis. The requisition calls for the following: One set 12-foot bending rolls for ¾-inch plate, one pneumatic stay bolt nipper, one Ferguson combination spring fitting case hardening furnace, two 34-inch Gisholt turret lathes, two double punches and shears, 36 inch; three 36 x 36 inch x 10 foot metal planers, one 5-foot radial drill, one 2 x 26 inch hollow turret lathe, two No. 3 universal brass turret lathes, one 24-inch x 16-foot engine lathe, one 32-inch x 14-foot engine lathe, one 28-inch x 18-foot engine lathe, one 18-inch x 10-foot engine lathe, one 14-inch x 8-foot toolroom lathe, extra taper attachment; one 18-inch slotter, two 12-foot flanging clamps, two horizontal boring and drilling machines, 4-inch spindle, 4-foot table. A portion of the above list is to be motor driven, remainder straight belt drive.

The Houston, Stanwood & Gamble Company says that the condition of trade with it in the territory where it finds most of its business is good, and that the last four months it has been about 33 per cent. more than it was during the last four months of 1904. Prices are reported to be practically the same as they were in September of last year, it having at that time made a slight change in them. The reports that the company receives from its various agencies and also from representatives at New Orleans and St. Louis show that inquiries are very good. The company is now furnishing one 100 and one 250 horse-power engines and two 150 horse-power boilers to the Louisiana Saw Mill Company, Alonzo, La.; one 250 horse-power engine for Hendricks, W. Va., through its agents at Jacksonville, Fla.; 75 horse-power saw mill outfit and one 150 horse-power engine for Pioneer Lumber Company, Pioneer, Tenn., also an outfit consisting of engine and boiler for Obion, Tenn.; one 25, one 40 and one 50 horse-power engines to its New York agent for export; an outfit consisting of 100 horse-power engine and 125 horse-power boiler for Wagar, Ala., and two engines for the Logansport Distilling Company, Logansport, Pa.

The R. K. LeBlond Machine Tool Company reports that it has all it can possibly do for some time ahead. It recently has been doing considerable work in the way of railroad shop equipment, which, in connection with the work already booked, has crowded the facilities to the utmost. In fact, the company has found it necessary to get additional space and to this end has decided to increase the capacity of both the milling machine and lathe departments by utilizing the floor space now devoted to a pattern shop. In this it will rearrange the machinery, probably adding a small number of new tools. Later in the season the company will erect a new building to serve as a pattern shop. Foreign trade is away beyond what it was a year since and is rapidly increasing.

The Sebastian Lathe Company says that business this year is far ahead of what it was a year ago and that the situation is very satisfactory as far as it is concerned. It is contemplating taking on a larger line of tools and will probably add several larger sizes to its line. Trade with Japan continues to be fairly active and the company is receiving a few orders from that country. Last week it shipped a number of its largest size lathes to a Japanese point and also made a shipment to England.

The D. T. Williams Valve Company now has its plant under full headway and reports trade as very satisfactory. It is constantly adding to its equipment and rearranging tools to suit changing conditions.

The American Tool Works Company is in line with other machine tool builders and has order books well covered for the future. Foreign and domestic inquiry is of the best and apparently is on the increase. Changes are continually being made in its tools with a view to increasing their efficiency.

The Cincinnati Milling Machine Company's new addition is rapidly filling up the areaway in between what was the older portion of the plant and when completed will give the concern an immense amount of floor space. Trade both far and near is said to be of the best, and no difficulty is experienced in disposing of its tools as rapidly as produced.

The L. B. Harrison estate was granted a permit to erect a large 12-story concrete and steel power building for light manufacturing purposes at Fourth and Elm streets, this city, to cost $300,000.

The Vulcan Foundry Company will erect a large new foundry on Dayton street, along the Cincinnati, Hamilton & Dayton Railroad, at Hamilton, Ohio.

Government Purchases.

WASHINGTON, D. C., May 23, 1905.

The Bureau of Supplies and Accounts, Navy Department, will receive bids until June 20 for a quantity of supplies for the Mare Island and Puget Sound navy yards, including forming, burring and crimping machines, shears, punch, tool cutter, post drill, turbine pump, shaper, lathes, nut facing and slotting machine, drill press, pipe threading machine, grinders, band saw machine, molding machine, planers, surfacer, bender, leveling machine, punch and shears, forges, sanding machine, &c.

The Treasury Department has authorized the superintendent of the Lewis and Clark Exposition to expend $60,000 for a pumping plant for the life saving station at the exposition to be held in Portland, Ore.

The following bids were opened May 16 for the Mare Island and Puget Sound navy yards:

Bidder 7. Becker-Brainard Milling Machine Company, Hyde Park, Mass.

34. Cleveland Punch & Shear Works Company, Cleveland, Ohio.

35. Caldwell Bros. Company, Seattle, Wash.

36. Compressed Air Machinery Company, San Francisco, Cal.

42. Eby Machinery Company, San Francisco, Cal.

64. Harron, Rickard & McCone, San Francisco, Cal.

66. Handlan-Buck Mfg. Company, St. Louis, Mo.

67. Henshaw, Bulkley & Co., San Francisco, Cal.

69. Hallidie-Henshaw-Bulkley Company, Seattle, Wash.

85. Manning, Maxwell & Moore, New York.

89. Morgan Engineering Company, Alliance, Ohio.

103. Niles-Bement-Pond Company, New York.

106. Pacific Tool & Supply Company, San Francisco, Cal.

108. Royce & Ricketts, Washington, D. C.

121. Wm. Sellers & Co., Incorporated, Philadelphia, Pa.

138. Tatum & Bowen, San Francisco, Cal.

Schedule No. 154.

Class 1. One gear dovetailing machine, motor driven—Bidder 42, $750; 64, $649; 67, $725 and $970; 138, $624.

Class 2. One double ended punch—Bidder 34, $5950; 36, $8000; 64, $6864; 67, $5396 and $5496; 89, $8570; 103, $7452; 138, $5753.25.

Class 3. One motor driven single plate planing machine—Bidder 34, $3250; 64, $4452; 67, $5225; 103, $5225; 121, $5425 and $5045.

Class 4. One No. 4 plain milling machine, motor driven—Bidder 7, $2363.28; 67, $2470; 103, $2095; 106, $2145; 138, $228.25.

Class 5. One pipe expanding and flanging machine—Bidder 36, $3548.

Schedule No. 155.

Class 6. One upright drill press—Bidder 35, $150 and $188; 36, $138; 69, $150, $124 and $110; 85, $165; 103, $185; 106, $135; 108, $175; 138, $169.

Class 7. One single geared crank shaper—Bidder 35, $273; 36, $297; 69, $310, $254 and $290; 85, $325; 103, $250; 106, $310; 108, $320; 138, $301.50.

Class 8. One screw cutting extension gap lathe—Bidder 66, $775; 69, $611; 85, $775.

The Isthmian Canal Commission opened bids May 10 for earth spreaders, unloading machines and unloading plows, as follows:

Class 1. One 60-ton unloader with steel car, two 25-ton unloaders with steel cars, two extra flexible steam connections, 2000 feet of wire cable, 24 extra Crosby clips; 2, two left hand unloader plows, three right hand unloader plows; 3, three earth spreaders for use on a track having a gauge of 5 feet.

Mann-McCann Company, Chicago, Ill., class 3, $14,607; delivery in four months.

Henry H. Meyer, Baltimore, Md., class 1, $23,782.79.

Marion Steam Shovel Company, Marion, Ohio, class 2, $4325.

The Isthmian Canal Commission opened the following bids on May 16:

Item 1, one 10-ton locomotive crane; 2, one 20-ton locomotive crane.

Industrial Works, Bay City, Mich., item 1, $6995, and crane with cap with 14 tons at 15 feet as per letter, $9162; 2, $8112.

Wellman-Seaver-Morgan Company, New York, item 1, $8400.

Browning Engineering Company, New York, item 1, $7315, additional for packing, insurance, freight to New York and Colon and lighterage, $522, additional for traveling expenses, 20 days, salaries, fares, &c., $335, total for item, $8172; 2, $7775, additional for packing, insurance, freight to New York and Colon and lighterage, $550, additional for traveling expenses, 20 days, salaries, fares, &c., $335, total for item, $8660.

Brown Hoisting Machinery Company, New York, item 1, $9190; 2, $11285.

American Hoist & Derrick Company, St. Paul, Minn., item 1, $9000, for lagging boiler add $100, delivery within 60 days; 2, $6600, for lagging boiler add $100, delivery in 20 days.

The following bids were opened May 13 at the office of the Isthmian Canal Commission, under schedule 209:

Bidder 1. Fairbanks, Morse & Co., Chicago, Ill.
2. United States Steel Products Export Company, New York.
3. Schroeder Headlight Company, Evansville, Ind.
4. Roberts Car & Wheel Company, Three Rivers, Maine.
5. S. A. Woods Machine Company, South Boston, Mass.
6. Handlan-Buck Mfg. Company, St. Louis, Mo.
7. C. T. Patterson Company, Limited, New Orleans, La.
8. Buda Foundry & Mfg. Company, Chicago, Ill.
9. Pratt Iron Works Company, Dayton, Ohio.
10. Laidlaw-Dunn-Gordon Company, New York.
11. Patterson, Gottfried & Hunter Company, New York.
12. Manhattan Supply Company, New York.
13. Niles-Bement-Pond Company, New York.
14. J. W. Cregar Agency, Philadelphia, Pa.
15. Warsaw, Wilkins & Co., Warsaw, N. Y.
16. Rand Drill Company, New York.
17. H. A. Rogers, New York.
18. J. Scholl & Co., New York.
19. Lansing Wheelbarrow Company, New York.
20. William Sellers & Co., Philadelphia, Pa.
21. Fox Brothers & Co., New York.
22. Rand-Mayer-Carpenter Company, Cincinnati, Ohio.
23. New Jersey Foundry & Machine Company, New York.
24. Ingersoll-Sergeant Drill Company, New York.
25. Iroquois Iron Company, Philadelphia, Pa.
26. Kelly Springfield Road Roller Company, Springfield, Ohio.
27. Barber & Ross, Washington, D. C.
28. Royce & Rickets, Washington, D. C.
29. F. S. Banks & Co., New York.
30. Dressel Railway Lamp Company, New York.
31. Chicago Pneumatic Tool Company, New York.
32. Manning, Maxwell & Moore, New York.
33. Adams-Westlake Company, Philadelphia, Pa.

Class 1.

Item 1. No. 30 brass casting tumbler—Bidder 14, see item 2; 17, $100; 32, $151.87; 7, $98.25.

Item 2. No. 44 cast iron tumbler—Bidder 7, $835.94; 14, items 1 and 2 combined, $636; 15, $594; 17, $696; 32, $730.08.

Item 3. 12-inch independent two-jaw box body chucks—Bidder 14, $60; 17, $51.75; 32, $51.87.

Item 4. 9-inch three-jaw combination chucks—Bidder 14, $61.20; 17, $55.50; 32, $43.65.

Item 5. 6-inch three-jaw combination chucks—Bidder 14, $43.20; 17, $34.50; 32, $46.47.

Item 6. No. 15 round swivel base planer chucks—Bidder 7, see item 8; 13, $199.80; 14, $210; 17, $180; 32, $192.06.

Item 7. 24-inch square base planer chucks—Bidder 7, see item 8; 13, $100.70; 14, $105; 17, $90; 32, $96.02.

Item 8. 30-inch square base planer chucks—Bidder 7, $655.87 for items 6, 7 and 8; 13, $67.55; 14, $70; 17, $60; 32, $64.02.

Item 9. No. 1 leveling jacks—Bidder 17, $27; 32, $22.50.

Item 10. No. 2 leveling jacks—Bidder 17, $26.40; 32, $18.76.

Item 11. No. 3 leveling jacks—Bidder 17, $18; 32, $11.29.

Item 12. Dubuque pattern maker's disk grinder—Bidder 17, $115; 32, $229.92.

Item 13. Wet tool grinders—Bidder 7, $91.72; 14, $110; 32, $141.86.

Item 14. No. 2 16-inch cylinder joining and hand planing machine—Bidder 5, $200; 14, $210; 17, $141.75; 32, $208.16.

Item 15. 32-inch upright drill presses—Bidder 7, $1464; 13, $1026; 17, $1026; 32, $1199.34; 28, $900.

Item 16. 24-inch friction planer, drive shaper with swivel vise—Bidder 7, $896.24; 14, $850; 32, $983.84.

Item 17. 18-inch by 8-foot Acme quick change engine lathe—Bidder 13, $3780; 14, $3255; 17, $3780; 22, $2517.60; 32, $3061.38.

Item 18. 40-inch automatic knife grinder complete—Bidder 5, $375; 14, $220; 17, $156; 32, $233.75.

Item 19. No. 4 vertical hollow chisel car mortising machine—Bidder 5, $900; 14, $1070; 17, $1070; 32, $1459.29.

Item 20. Mortiser and boring machine—Bidder 14, $230; 17, $227.50; 32, $174. 98.

Item 21. No. 40 four-roll double cylinder planer and masher—Bidder 5, $1700; 14, $750; 17, $740; 32, $689.96.

Item 22. No. 4 collar ripping saw—Bidder 14, $350; 17, $297; 32, $542.59.

Item 23. No. 2 three-spindle car boring machine—Bidder 5, $800; 14, $525; 17, $540; 32, $846.92.

Item 24. No. 5 B single axle lathe—Bidder 13, a $1642, b $1818; 17, $2389 or $2192; 28, $1840; 32, $884.31.

Item 25. 42-inch car wheel borer—Bidder 13, $1489; 17, $1489; 32, $1339; 20, $1875.

Item 26. No. 2 N hydraulic wheel press—Bidder 13, $835; 14, $1065; 17, $835; 20, $1585; 32, $1061.18.

Item 27. No. 5 pipe threading machine—Bidder 7, $1408.70; 14, $1250; 17, $1730; 28, catalogue of Curtis & Curtis No. 109, $799, No. 110 $780, No. 111, $837.50, No. 112 $1265, No. 114 $1456, No. 107 $1764.50, No. 108 $1955, No. 110 $2906.50; 32, $1640.61.

Item 28. Standard 60-foot turntables—Bidder 2, $2964 or $2474; 32, $3130; 20, $3440.

Item 29. 16-inch Star standard American headlight—Bidder 3, $1944 round or $1840 square; 33, $1775; 17, $2050; 30, $1815; 32, $2046.

Item 30. Westinghouse air brake equipment for four-wheel dump car—Bidder 32, $3018.

Class 2.

Taps, plugs, mandrels, pin reamers, taper pins, ring gauges, alligator wrenches, screw jacks, &c.—Bidder 6, $4493.50; 7, $3734.81 except the last item of gauges; 8, for No. 2 Barrett jacks only, Colon delivery $206.40, New York $196.80; 11, $4219.69; 12, $3120.26; 17, $4169.61; 21, $4705.70 for the class complete except cylindrical standard plugs and ring gauges and drop forged steel caliper gauges; 29, $3971.73; 31, $3608.84.

Class 3.

Item 1. Type 10 air compressors—Bidder 9, $32,160; 10, $28,925; 16, $33,600; 24, $33,450 or $38,700 for class G. C. air compressor, air capacity 25,000 cubic feet, weight about 73,500 pounds; 31, $33,330.

Item 2. Type 10 air compressor, capacity 1050 feet—Bidder 10, $3075; 9, $3575; 16, $3200; 24, $3500; 31, $2950.

Total—Bidder 10, $3199; 9, $35,735; 16, $36,800; 24, see items above; 31, $36,280.

Class 4.

Item 1. 10-ton steam road roller—Bidder 18, $2700; 23, $2390; 25, $2985.10; 26, $2800.

Item 2. 12 to 13 ton steam road roller—Bidder 18, $2900; 23, $2595; 25, $2985.10; 26, $2950.

Class 5.

Item 1. Buda hand cars No. 4—Bidder 1, see total below; 4, $35 each; 8, see total below; 29, $6033.50; 32, $4985.20.

Item 2. Buda hand cars No. 6—Bidder 4, see total below; 8, see total below; 19, $2695; 29, $3696; 32, $3613.50.

Total—Bidder 4, $6380 for Roberts cars; 1, $6600 for Sheffield car No. 2 under item 1 and Sheffield car No. 4 under item 2; 8, $7040; 29, $9729.50; 32, $3613.50.

Bids for eight 8-inch, twelve 7-inch and thirty-two 6-inch guns for the battle ship New Hampshire and the armored cruisers Montana and North Carolina were opened at the Navy Department, Washington, on May 22, as follows: Eight-inch, Bethlehem Steel Company, $21,690 each, Midvale Steel Company, $17,142 each; 7-inch, Bethlehem Steel Company, $19,999 each, Midvale Steel Company, $14,315 each, and 6-inch, Bethelehem Steel Company, $12,850 each, Midvale Steel Company, $12,283 each. These bids are for guns without mounts.

A few weeks ago we noted in these columns that the Ingersoll-Sergeant Drill Company and the Rand Company had each received an order for 50 rock drills from the Isthmian Canal Commission. This order has since been canceled and contracts have been awarded for 25 drills each to the Chicago Pneumatic Tool Company, New York; Sulli-

van Machinery Company, Chicago, Ill.; Rand Drill Company, New York, and Ingersoll-Sergeant Company, New York.

An order has been placed with the Ingersoll-Sergeant Drill Company, New York, by the Navy Department for a class "G. C." air compressor to be located at the Portsmouth Navy Yard. The compressor has compound steam cylinders, 19 and 35 inches in diameter; compound air cylinders, 32¼ and 20¼ inches in diameter and 24-inch stroke. Its capacity is 2179 cubic feet of free air per minute.

New York Pig Iron Warrant Market.

Sales of pig iron storage warrant certificates on the New York Produce Exchange for the past week aggregated 1300 tons. Of this amount 500 tons foundry were sold at $15.50, February delivery, and 100 tons foundry, October, $15.90. Sales of regular certificates were as follows: May, 200 tons, $14.75, 100 tons, $15; June, 100 tons, $14.85; July, 100 tons, $15.30; October, 100 tons, $15; February, 100 tons, $15. The following prices were established on call Wednesday noon:

	Regular.		Foundry.	
	Bid.	Asked.	Bid.	Asked.
Cash	$14.50	.....	.....	.....
May	14.50	.....	.....	$16.25
June	14.50	$15.00	.....	16.00
July	14.75	15.00	$15.60	15.75
August	14.75	15.10	.....	.....
October	14.75	15.00	15.25	16.00
November	14.75	15.00	.....	.....
December	14.75	.....	.....	.....
February	14.75	15.00	15.50	15.90

Labor Notes.

The annual convention of the Tin Plate Workers' Protective Association, in session at Wheeling, W. Va., adjourned May 18, after selecting Canton, Ohio, as the place for the 1906 convention. The scale for tin house labor formulated by this organization calls for slight advances in wages and will be presented to the tin plate manufacturers at an early date. The present officials of the association were re-elected, as follows: George Powell, president; W. S. Hunt, vice-president, first district; B. L. Bartlett, vice-president, second district; H. E. Bartlett, vice-president, third district; Benjamin Teagarden, vice-president, fourth district, and Charles E. Lawyer, secretary and treasurer.

At Pittsburgh the molders employed in the foundries of concerns who are not members of the Manufacturers' Association of that city have made a demand for a minimum wage for molders of $3.30 per day. The demand does not affect concerns belonging to the Manufacturers' Association, which about six weeks ago voluntarily gave their employees an advance of 10 per cent. They have no standard rate of wage, but pay a molder based on his ability as a workman. The demand for a minimum rate of wage of $3.30 a day is to become effective on June 1, but probably will be contested.

The strikers at the hoop mills of the Carnegie Steel Company, at Youngstown, Ohio, made an effort at the Detroit convention to have the Amalgamated Association declare the strike off and permit them to go to work in these mills. The association refused to do this, and now it is stated that the strikers have decided to surrender their charters and give up their lodges. By doing this the men can apply for work in these mills as individuals, being unable to get employment as long as they are members of the Amalgamated Association.

The New York branch of the Associated Foundry Foremen will hold its next meeting at Franklin Hall, corner Montgomery and Warren streets, Jersey City, on Saturday evening, May 27, at 8 o'clock. The following papers will be read: "Pig Iron Warrant and Certificate System," by George H. Hull, president American Pig Iron Storage Warrant Company; "A Foundry Foreman," by S. M. Williams.

The Pittsburgh Railways Company has placed an order for 100 large double truck cars with the St. Louis Car Company, making 460 new cars the company has bought in the past two years.

Trade Publications.

Guide to Panama.—The Commercial Museum, Philadelphia, has issued separately the Panama section of its Foreign Commercial Guide, which is designed to meet the demand for accurate information regarding this section of Central America. In addition to a specially prepared map it gives a gazetteer of cities, towns, villages, rivers, mountains, &c.; commercial information, political features, shipping guide, an analysis of imports and the character of the natural resources. The publication comprises 20 large pages and is sold at 50 cents per copy.

Gas Engines.—Western Iron Works, Los Angeles, Cal. Illustrated catalogue; size, 6 x 9 inches; pages, 24. Contains description of the Western gas engine, which is designed for all power purposes and may be operated equally well without special apparatus and without generators, on gasoline, naphtha, benzine, light and heavy distillates and kerosene, also with manufactured, natural or producer gas. In the liquid fuel pattern the peculiar value is said to lie in the fact that the engine vaporizes and gassifies heavy fuels as well as the volatile fluids. It is also claimed that the engine is lighter in weight per horse-power than any other horizontal gas engine. In the catalogue the details of the engine's construction are explained at some length and interesting figures are given on the cost of operating.

Electrical Apparatus.—National Electric Company, Milwaukee, Wis. Two cards. One of these gives a view of two 1000-kw., 600-volt rotaries, installed for the Milwaukee Light, Heat & Traction Company, at West Allis, Wis. The other is concerned with the Christensen air brakes equipment and shows an interurban car of the Dayton & Troy Electric Railway, which is equipped with Christensen air brakes. This line is said to operate the fastest trolley service in the world carrying passengers on regular schedule.

Conveyors.—C. W. Hunt Company, West New Brighton, N. Y. Catalogue No. 055; size, 6¾ x 9¼ inches; pages, 52. Particularly pertains to the Hunt noiseless conveyor and other machinery for handling coal and ashes in power stations. Illustrations show the parts which enter into various types of equipments, including the pushers, buckets and tracks, engines, fillers, dumping devices, &c. Views taken of a large number of actual installations are included, and there are also shown sectional elevations of several complete systems widely different in character.

Pipe Threading Machines.—Standard Engineering Company, Ellwood City, Pa. Circular. Contains a brief description and specifications and front and rear views of the Standard Wieland 8-inch pipe threading and cutting machine. A 4-inch machine of the same type was illustrated in *The Iron Age* October 6, 1904.

Automobiles.—H. H. Franklin Mfg. Company, Syracuse, N. Y. Catalogue. Shows six 1905 models of Franklin motor cars, including a roadster and three light touring cars, all of 12 horse-power, and 20 and 30 horse-power touring cars. A comprehensive description of the features and parts of Franklin cars as a class is given, and a very clear explanation of the difference between a motor car's theoretical or rated horse-power and its actual ability.

Rolls and Crushers.—Sturtevant Mill Company, Boston, Mass. Folding mailing card. Contains engravings of each of the following machines and a brief statement of the service for which they are adapted: Steel ore breaker, rotary fine crusher, roll jaw fine crusher, laboratory jaw crusher, balanced rolls, centrifugal finishing rolls and sample grinder.

High Speed Twist Drills.—Lincoln-Williams Twist Drill Company, Taunton, Mass. Circular. Refers briefly to remarkable results which have been obtained by using high speed steel in machine tools, and the demand which led to the production of a line of high speed twist drills by this company. Tables of sizes and prices of stock drills carried are given.

Steam and Water Specialties.—Schutte & Koerting Company, Philadelphia, Pa. Three circulars. The first applies to water spray ventilators for mines, illustrating their use and advantages and giving the capacities and prices of seven different sizes of the apparatus. Second circular deals with water jet pumps, or eductors, in which water under high pressure is made the means of removing water at atmospheric pressure from sump pits and the like. One of these eductors is made automatic in its action by the use of a ball float. The third circular merely refers to an automatic free exhaust and back pressure valve with patent noiseless piston and illustrates one of remarkably large size.

Standard Tables.—E. E. Meyer, Allegheny, Pa. Lists Nos. 1 and 2 of cards containing tables of information useful to draftsmen, machinists, engineers, &c. These include forces on inclined planes, United States standard bolts and nuts, standard gear proportions, United States standard steam, gas and water pipe; Pencoyd rivet proportions, standard wire gauges, screw thread sections, weights and areas of round, hexagon and square steel bars; worm thread sections, decimals and fractions, rope haulage and transmission, American standard rail sections, strength of square wooden pillars, strength of rectangular wooden pillars, safe loads for wooden beams, weights of plate iron and steel, and United States standard measurements.

HARDWARE.

IN connection with and partly as a result of the public discussion in their broadest aspects of the questions concerning transportation and the regulation of freight rates, it is an indication of progress in actual business practice that the subject is being taken up in trade gatherings and canvassed in its practical bearings. Thus it was made a prominent topic at the recent convention of the Manufacturers' Association at Atlanta and is to be one of the two or three leading questions which will command the attention of the jobbers and manufacturers at their meeting early next month. At the same time it is one of the matters in which the American Hardware Manufacturers' Association is showing its interest and doing effective work.

There are certainly few subjects which are of greater importance to the commercial classes of the country, and yet it is the general impression among those well informed in such matters that comparatively few manufacturers and merchants give it the attention it deserves. Apart from the correction of what are unquestionably evils and abuses, of which the great shippers are the principal beneficiaries, and which involve grave public questions to the solution of which individuals can contribute only indirectly, there are without doubt many things to which business men might, very much to their advantage, give careful attention. This is especially true of the smaller merchants and manufacturers, who are peculiarly apt to neglect this matter in its immediate relations to their own business. There is too much of a disposition to accept existing conditions and methods, notwithstanding much that is inequitable and unsatisfactory, without any vigorous attempt to remedy them, while in not a few cases lack of familiarity with the subject and with the opportunities which are within the reach of those who know enough to avail themselves of them puts both merchants and manufacturers to loss and expense which might be avoided, and causes them to carry on business at a disadvantage which is not suffered by their more vigilant competitors.

In connection with the general discussion of the subject the following points are referred to as covering some of the matters in which the trade are suffering, partly from their own neglect and partly from practices of which they have a right to complain:

That goods are often given a less favorable classification than they are entitled to;

That shipments are often delayed unreasonably en route, sometimes to the serious injury of the shipper or consignee;

That manufacturers and jobbers frequently fail to send bill of lading with rate of freight, and that the railroads take advantage and charge a higher rate;

That goods are sometimes lost or stolen on the way;

That merchants are often negligent and fail to check and verify freight charges;

That it is exceedingly difficult to obtain redress from the transportation companies on account of loss or damage to goods, unreasonable delays on the road, errors in freight bills, &c.

Other points will doubtless occur to our readers, suggested by their own immediate contact with the problems connected with transportation. There is certainly reason for a careful consideration of the subject not merely in its broader bearings, but in the details of freight matters as related to the immediate interests of each merchant and manufacturer.

The meeting of the Hardware clans at Virginia Hot Springs, June 6, promises to be thoroughly representative of the trade. Besides the Southern Hardware Jobbers' Association and the American Hardware Manufacturers' Association, both of which will be in attendance in formal session, there will be representatives from the National Hardware Association and the National Retail Hardware Association. In addition to this it is anticipated that several of the great independent jobbing houses of the country will also be in attendance as guests of the manufacturers. The topics which will be considered are peculiarly appropriate at this time. Besides the catalogue house question, which will be discussed by the chairman of the Joint Committee and by the special representative of the Southern Association on such committee, as well as by the president of the Retail Association, freight matters will be considered under the leadership of E. B. Pike, and the important subject of restricted prices will also be a prominent topic. The presence of Secretary Taft and Senator Carmack as special guests will add to the interest of the occasion. The indications thus point not only to a large attendance, but to a very interesting and significant convention.

Condition of Trade.

The business of jobbers and retailers is moving along steadily and in what is generally regarded as reasonably satisfactory volume. It is evident that the distributers throughout the country are doing at least a normal business and that many goods are going into consumption. The demand is most marked on season articles, but Builders' Hardware and Tools generally are in active request. Indications continue to point to a good amount of building, labor troubles not being as prominent as in recent years. In this fortunate condition of things Chicago is, of course, an important exception. Prices are generally well maintained. A few lines here and there show occasional weak spots, often owing to the fact that one or more of the manufacturers making the goods in question are especially desirous of securing orders while their more fortunate competitors are in a position to hold more firmly to regular quotations. The policy of the trade in regard to purchases is to cover early requirements, but not to order too far in advance. Collections generally are excellent.

Chicago.

Notwithstanding the unfavorable influence of the teamsters' strike, which has been in force for seven weeks, business of local jobbers has continued to be good. Police protection has been afforded the boycotted jobbers so that they could make deliveries where the importance of the business warranted the call on the police department, but in many cases the local merchants themselves, in communities that are largely sympathetic with unionism, preferred not to have goods reach them under police protection because of the enemies such a step would make among their local customers. Country trade has been good and many country merchants have made it a point to increase their business with Chicago jobbers in order to show their sympathy with a stand against the abuse of union power. Last week's meeting of independent Wire manufacturers has had a good effect on the Wire and Nail market and one hears much less about price cutting than he did before. This is not true, however, of Cut Nails, and jobbers claim that they have no difficulty in securing whatever Steel Cut Nails they desire at $1.80,

Chicago. There is an overstock of Galvanized Sheets in the hands of local jobbers and retailers. While the consumption of Galvanized Sheets has been and is very large, the fact now develops that consumers themselves covered very heavily. The result of this is a much softer tone in Galvanized Sheets. Builders' Hardware is still active, and five or six large buildings are being figured on. A shortage is beginning to develop in Lawn Mowers and in the expensive grades of Refrigerators. Eaves Trough and Conductor Pipe and kindred lines are in active demand and the price cutting that was prevalent a month or two ago has almost entirely disappeared. May will be a good month with wholesalers and retailers in all Hardware lines.

The sales department of the American Steel & Wire Company sent out to the leading jobbers of the country a letter asking for a frank statement of general market conditions, past, present and future. The replies, several hundred in all, were epitomized and summarized, the net result being the following consensus of opinion:

1. Business for the first four months of 1905 compares favorably with the same period last year, and the outlook for the future is satisfactory.

2. Crop prospects are good except in Texas, Arkansas and Louisiana, where heavy and late rains have interfered.

3. Retail merchants have had a good trade and are carrying small to medium stocks. Are disposed to await the outcome of the present crop before buying largely. If the crop proves favorable there will be heavy buying all over the country.

4. Farmers generally have realized their expectations on last season's crops, and present indications are that the forthcoming crops will be as good or better. The cotton crop was greater than expected, resulting toward the end of the season in low prices; should the present crop prove short, as seems possible, it will be a blessing, as better prices will be realized and vast tonnages now in store will be turned into money. Farmers evince a disposition to buy liberally both necessities and luxuries.

5. Manufacturing industries in every locality are fully employed.

6. Building outlook is very promising and (outside of Chicago) no labor troubles are present or pending.

7. Banks are full of money and reflect a normal, healthy and hopeful tone, with a disposition to loan conservatively at reasonable interest rates.

NOTES ON PRICES.

Wire Nails.—A stronger market has developed as a result of the action taken by mills at the recent meeting held in Chicago to maintain regular quotations. Some of the smaller and weaker outside mills are reported as still shading prices to some extent, but manufacturers in general are holding to official quotations. Stocks in jobbers' hands are moving more freely, and the market shows encouraging signs of stability and activity. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carloads to retailers	1.85

New York.—Jobbers report an excellent demand so far this month. The local market remains firm and prices are unchanged, as follows: Single carloads, $1.99; small lots from store, $2.05.

Chicago, by Telegraph.—Buyers claim that they can shade official prices from mills that are outside of the independent manufacturers' association and from one or two weak mills inside that organization, as well as from jobbers who have large stocks on hand bought at lower prices. Representative mills of weight and standing in the trade are disposed, however, to hold firmly to official prices, which are as follows: $1.95, base, in car lots to jobbers; $2 in car lots to retailers, with 5 cents advance for less than car lots from mill.

Pittsburgh.—The recent action taken by the leading Wire Nail mills at their meeting in Chicago in deciding to maintain a strong market is reflected in prices, which are very firm. Most mills have a number of contracts placed by jobbers when prices were somewhat lower than they are now, and specifications on these are coming in very freely, while new orders are more plentiful than for some time. Jobbers report that their stocks of Wire Nails are moving out faster since the favorable weather started, and the general condition of the Wire Nail trade, both as regards prices and demand, is better than for some time. It is not unlikely the manufacturers will meet again at an early date to discuss conditions of the market. We quote Wire Nails at $1.80 in carload lots to jobbers and $1.85 to single carload buyers, actual freight from Pittsburgh to point of destination being added.

Cut Nails.—The Western market does not appear to be as much in sympathy with a stronger market as the territory further East, as irregularities in prices of Steel and Iron Cut Nails are still reported. The market, however, is generally reported as firmer, while the demand continues moderate. Manufacturers are avoiding an accumulation of stocks by keeping production down to demand proportions. Quotations are as follows: Carload lots, $1.80; less than carload lots to jobbers, $1.85, and to retailers, $1.95, f.o.b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails.

New York.—The demand continues seasonable, and in fair proportion to orders of Wire Nails. New York quotations are as follows: Carloads on dock, $1.94; less than carloads on dock, $1.99; small lots from store, $2.

Chicago, by Telegraph.—Quotations are still being received from some makers of Steel Cut Nails 10 cents below the Wire Nail schedule, while Iron Cut Nails can be bought at the official price of Wire Nails. Car lots to jobbers, $1.95, base; car lots to retailers, $2. Small lots from store are offered at from $2 to $2.05.

Pittsburgh.—We note a moderate demand and in sympathy with Wire Nails prices are firmer than for some time. The mills are endeavoring as nearly as possible to prevent any accumulation of large stocks, and are running their mills only as full as actual demand warrants. We quote Cut Nails as $1.75 to $1.80, base, in carloads, f.o.b. maker's mill. Iron Cut Nails command an advance of 5 to 10 cents a keg over these prices.

Barb Wire.—The disposition of the larger portion of manufacturers is to hold to the official schedule, while some manufacturers would be favorably disposed toward higher prices. Demand from mills and jobbers is reported as showing more activity. Quotations are unchanged as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago, by Telegraph.—While price cutting is occasionally indulged in by some of the weaker mills, the leading producer and the stronger independents are disposed to hold firmly to the official schedule, which is as follows: Painted Wire, $2.10; Galvanized, $2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, $2.25; Galvanized, $2.55; Staples, Bright, in car lots to jobbers, $2.05; Galvanized, $2.35; car lots to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

Pittsburgh.—There has been considerable movement in demand for Barb Wire, which is going out from the mills and also from jobbers' warehouses more freely and for some time. The tone of the market is firmer and some of the manufacturers favor an advance in prices. To discuss this it is probable a meeting of the Barb Wire makers will be held early in June. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Smooth Fence Wire.—Demand is fair, and a general disposition on the part of the majority of the mills is to ask official prices. Some price weakness is reported on the part of a few mills, but the large majority of orders are being entered by the mills at the regular quotations. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....$1.65
Retailers, carloads..... 1.70

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—Now that the season has passed its climax there is some disposition on the part of the weaker mills to shade prices in return for liberal tonnage and prompt payment, but the general tone of the market is firm and prices, as a rule, are well maintained on the following basis: $1.80, base, for Annealed Wire, in car lots to jobbers; $1.85 in car lots to retailers, with 5 cents advance for less than car lots and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—While demand is only fair it is slowly getting better and shipments from the mills and also by the jobbers are heavier than for some time. The mills are adhering rigidly to prices and all new business is being entered at official figures. There is a feeling among the trade that with a heavier demand and the large stocks held by jobbers moved out the market will stand a moderate advance, and a meeting of the mills to discuss this and other matters will probably be held early next month. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....$1.65
Retailers, carloads..... 1.70

Conductor Pipe and Eaves Trough.—The National Conductor Pipe Association, composed of manufacturers of Conductor Pipe and Eaves Trough, has adopted the following discounts and prices to dealers in the various territorial limits, as defined. The new schedules, which record many changes from those previously in force, became effective May 22, replacing the recommendation of March 23. Territories not enumerated under Eastern, Central, Southern and Southwestern Territory, it will be seen, take the rates applicable to Central Territory, with freight allowance to Missouri River only, or the equivalent. To jobbers of these goods there is an additional discount. The following are the schedules of discounts just issued, terms 60 days or 2 per cent. discount for cash in 10 days:

Discounts on Conductor Pipe, Eaves Trough, &c.

	Eastern territory.	Central territory.	Southern territory.	Southwestern territory.
Galvanized Conductor Pipe, Nested.	70 and 15	70 and 7½	70 and 2½	60 and 20
Galvanized Conductor Pipe, not Nested	70 and 10	70 and 2½	60 and 20	60 and 10
Copper Conductor Pipe, 14 and 16 oz. Round, 2, 3, 4, 5, 6 inch. 14 oz. list: 40, 50, 65, 85, 100 per ft. 16 oz. list: 43, 54, 70, 92, 108 per ft. Square, 2, 3, 4, 5 inch. 14 oz. list: 42, 52, 67, 87 per ft. 16 oz. list: 45, 56, 72, 94 per ft.	50 and 5	50 and 2½	50	40, 10 and 5
Galvanized Eaves Trough	80 and 5	75, 10 and 10	75 and 12½	75 and 5
Galvanized End Pieces, Miters and Drops	35	35	35	35
Galvanized O. G., Box and Roof Gutters	80 and 5	75, 10 and 10	75 and 12½	75 and 5
Galvanized Plain Ridge Roll	80 and 7½	80 and 2½	75, 10 and 5	75 and 7½
Girth 8, 10, 12, 14 inch. List 16, 19, 23, 28 per foot.				
Galvanized Formed Valley	70 and 5	70	60, 10 and 10	60 and 12½
List based upon 1¼ cents per inch of Girth.				
Elbows, Galvanized Steel, Galvanized C. C. Iron, or Tin, list April 1, 1905: Standard Gauge	60 and 10	60 and 10	60 and 10	60 and 10
No. 26 Gauge	35	35	35	35
No. 24 Gauge	25	25	25	25
No. 22 Gauge	10	10	10	10
Copper Elbows	37½	37½	37½	37½

The following particulars in regard to freights, special conditions and territorial limits are given in connection with the official schedule of prices:

FREIGHT ALLOWANCE.

No freight allowance on shipments of less than 500 lineal feet. Freight allowed to destination on shipments of 500 feet or more, except as follows: Shipments into undefined territories, freight allowed to Missouri River only. Freight allowance on Elbows when shipped alone as per sheet of April 1, 1905. When shipped with Pipe or other articles in quantities of 500 feet or more freight may be allowed on Elbows also.

SPECIAL CONDITIONS.

Nested prices on Conductor Pipe are not allowable unless every joint in the crate will nest. For example, a shipment of 250 feet 3-inch, 250 feet 2-inch will take nested prices. A shipment of 500 feet 3-inch, 250 feet 2-inch will take not nested prices for 250 feet 3-inch and nested prices for the remainder.

Nested prices on Conductor Pipe are allowable for all deliveries made to local dealers, f.o.b. warehouse, or delivered by wagon to their places of business, but if delivered to transportation companies for shipment outside, regular prices will govern for the point of destination.

Territorial Limits.

UNDEFINED TERRITORY.

Territories not defined below will take the prices of Central Territory, with freight allowed to Missouri River only or the equivalent thereof.

EASTERN TERRITORY.

The Eastern Territory comprises all of the United States lying north of a line drawn from Newport News, Va., and following the line of the Chesapeake & Ohio Railroad from Richmond via Lynchburg to Clifton Forge, Va., and the Ohio River (including Norfolk, Va.) to the Mississippi River, the territory east of the Mississippi River and north of the Ohio River as far as the northern boundary line of Illinois, including Milwaukee, Wis., and excepting the upper peninsula of Michigan, which is placed in Central Territory.

CENTRAL TERRITORY.

The Central Territory consists of that part of the State of West Virginia and that part of the State of Virginia lying south of the Chesapeake & Ohio Railroad. The States of Kentucky, Missouri, Iowa, Wisconsin, except the city of Milwaukee, the upper peninsula of Michigan, and that part of the State of Minnesota lying south and east of the Minneapolis, St. Paul & Omaha Railroad from a point on the Iowa State Line near Worthington to Minneapolis and St. Paul and south and east of the St. Paul & Duluth Railroad from Minneapolis to Duluth; also the cities of Sioux Falls, S. D.; Charleston, S. C., and Savannah, Ga.

SOUTHERN TERRITORY.

The Southern Territory consists of the States of Mississippi, Alabama, Georgia, Florida, North Carolina, South Carolina and Tennessee, except the cities of Charleston, S. C., and Savannah, Ga., and including the cities of New Orleans, La.; Galveston, Texas, and Houston, Texas.

SOUTHWESTERN TERRITORY.

The Southwestern Territory consists of the States of Louisiana, Arkansas and Texas, except the cities of New Orleans, La.; Galveston, Texas, and Houston, Texas.

Edwin B. Stimpson & Son, 31 Spruce street, New York, are putting on the market Maple and Boxwood Rules and Rulers for a diversity of purposes, graduated in English and metric measurements, a leading line of which is their Maple and Boxwood Desk Rulers, sold at 30 and 10 per cent. discount from the following list:

No.	Description.	12-in.	15-in.	18-in.	21-in.	24-in.	
14	Maple	$9.36	$11.70	$14.50	$17.64	$20.75	Gross
21	Maple	17.78	22.46	27.14	33.55	42.12	Gross
28	Maple	22.06	26.83	32.12	39.00	48.36	Gross
35	Maple	22.06	26.83	32.12	39.00	48.36	Gross
49	Maple	37.44	46.80	56.16	67.39	82.36	Gross
50	Maple	56.16	65.52	74.88	87.39	101.08	Gross
51	Maple	24.31	30.81	37.34	44.46	50.98	Gross
52	Maple	28.92	36.73	44.17	52.62	60.02	Gross
77	Boxwood	5.33	6.73	8.14	9.82	11.23	Dozen
84	Boxwood	5.33	6.73	8.14	9.82	11.23	Dozen
91	Boxwood	6.62	8.30	10.10	11.95	13.75	Dozen
98	Boxwood	14.76	18.25	23.28	26.67	30.20	Dozen
100	Boxwood	6.85	8.49	9.82	12.72	15.44	Dozen

Window Glass.—The large demand for Glass anticipated because of early reports of extensive building operations has not been realized. While the value of buildings, for instance, for which permits were issued in April, 1905, shows an increase of 30 per cent. over April, 1904, as indicated by detailed figures from 50 cities in the United States, there has not been a corresponding increase in distribution of Glass from jobber to consumer. In fact, this distribution is estimated to be below the normal. It is to be borne in mind that the increase in valuation is due in a large measure, to the value of individual buildings, including tall ones for office purposes in the larger cities, in which no common Window Glass is used. The prospect is that there will be no scarcity of Window Glass to supply the summer demand. In this city business is quiet, a little more so perhaps than it has been so far this spring. While there are numbers of buildings in this immediate vicinity which will use Window Glass the glazing is not being done in the city, and city jobbers are not supply-

ing the Glass. It is represented that owing to labor troubles the glazing is done out of the city, where lower wages and longer hours make the operation more profitable. Local quotations are 90 and 10 per cent. discount on all sizes, single and double, with the exception of the first two brackets of Single Strength B, which are 90 and 20 per cent. discount. The exception is made to meet the price of machine made Glass.

Binder Twine.—Owing to the continued low price of Sisal fiber it does not seem probable that higher prices than those last made by the International Harvester Company will be made. On the other hand, it is reported that Sisal and Standard prices range from 9½ to 10 cents. Not many concerns are offering Manila grades, and in most instances at the quotations given below. The accompanying quotations represent the market fairly well:

Sisal	9½ to 10 c.
Standard	9½ to 10 c.
Standard Manila (550 feet)	11c.
Manila (600 feet)	12 to 12¼c.
Pure Manila (650 feet)	13¾c.

Five-ton lots, ⅛ cent less; carload lots, ¼ cent less, Chicago delivery, usual terms of payment. Kansas City, Omaha, Council Bluffs and Minneapolis, ¼ cent added. Prices not guaranteed. Allowing for freight, New York prices would be ¼ cent lower than the above.

Rope.—A more active demand has been experienced this week, which encourages manufacturers to look more hopefully upon the prospect of a satisfactory summer trade. Buyers, however, are confining their orders to small lots rather than buying in car lots. In fact, car lot orders are scarce. In the local market prices appear quite well sustained, in spite of the restricted volume of business. From other localities throughout the country reports are to the effect that in some cases less than carload lots are sold at carload prices to secure orders, and also that in other instances a better grade of Rope is shipped than is indicated by the price on the invoice. These inequalities will probably disappear in the event of a brisk demand. The market on Sisal Hemp continues weak. General quotations are as follows: Pure Manila, 11½ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 to 8¼ cents per pound.

Oils.—*Linseed Oil.*—In sympathy with the price strength of Seed and a comparatively light but steady demand, prices for Oil have been advanced 2 cents per gallon. Cake is scarce and higher as a smaller quantity of Seed is being crushed. Delieveries on Oil contracts are fair, but new business is light, only current requirements being covered. Quotations are as follows: City Raw, 50 to 51 cents per gallon, according to quantity; State and Western Raw, 48 to 49 cents.

Spirits Turpentine.—Since our report last week Turpentine has advanced 7 cents per gallon in this market. The causes for the advancing market are reported from the South as being the conflict of two of the combines to obtain control of the market, together with heavy shipments for export, good consuming demand and light receipts due to the lateness of the season. New York quotations, according to quantity, are as follows: Oil barrels, 72½ to 73 cents; machine made barrels, 73 to 73½ cents per gallon.

MICHIGAN RETAIL HARDWARE DEALERS' ASSOCIATION.

ELABORATE preparations are being made for the annual convention of the Michigan Retail Hardware Dealers' Association, which will be held at Saginaw on August 9, 10 and 11. The meeting will, it is expected, in practical interest and attendance surpass any former gathering of the association. A. J. Scott, secretary, Marine City, will be pleased to respond to any inquiries relative to the meeting.

JOHN J. HALPIN has retired from the firm of Crane & Halpin, 62 Reade street, New York, having transferred his interest to his partner, Gerard Crane, who has managed the business for the past ten years. The business, which includes the marketing of Hardware specialties, will be continued under the name of Gerard Crane & Co.

EAST ASIAN MERCANTILE COMPANY.

THE EAST ASIAN MERCANTILE COMPANY has recently been organized and incorporated under the laws of the State of New York for the purpose of conducting an export and import business with Siam and other far Eastern countries. The officers of the company are: Frank J. Oliver, president; M. A. Cheek, vice-president, and Thomas E. Oliver, secretary and treasurer. With these officials Herbert C. Cheek and James H. Oliver are associated as directors. The Messrs. Oliver are of the firm of Oliver Brothers, 127 Duane street, New York, and are well known from their prominent connection with Hardware interests, while the Messrs. Cheek have Eastern connections, having been engaged in a trading and commission business between Singapore and Bangkok. They are the sons of M. A. Cheek, an American, who became prominent as a merchant in Siam. M. A. Cheek, the vice-president of the company, was employed for some time by the Hardware jobbing house of Baker & Hamilton of San Francisco, and later by Lewis & Cook, Hardware merchants, at Honolulu. The East Asian Mercantile Company expects to act as Far Eastern agent for American manufacturers, and has already made arrangements to this effect with a number of leading houses. The company's attention has thus far been directed principally to the securing of such agencies, and to this M. A. Cheek has devoted several months, having recently left for the Far East, expecting to reach Singapore about August 1. For the purpose of facilitating the plans of the company connections have been established at London, England, and Hamburg. When its plans are completed, it is intended, in connection with the representation of manufacturers in Asia, to carry on an importing and exporting business in general merchandise. The New York office, 127 Duane street, is in charge of George H. Diehl, Jr., and Walter C. Knole.

CARVER FILE COMPANY.

THE CARVER FILE COMPANY, Philadelphia, Pa., was recently incorporated under the laws of Pennsylvania with $100,000 capital, fully paid in. The directors of the new corporation are: Samuel E. Carver, David Halstead and D. B. Murphy. The officers are: Samuel E. Carver, president and David Halstead, secretary and treasurer.

A new plant comprising two buildings, each 40 x 175 feet, one two stories and the other one story, is being erected on Frankford and Allegheny avenues. The capacity of the plant will be about 900 dozen per day. In the formation of the company the plant and business of the D. B. Murphy File Company, Camden, N. J., was absorbed. This plant, however, will be continued in operation independently on special light Files, all other grades being made at the new plant. It is expected that the new plant will be in operation by August 1, being already under roof. Most of the equipment has been purchased and boilers and engines are about to be installed.

Smith-Browne Hardware Company, incorporated with George H. Smith as president and general manager, Harry R. Browne, secretary, and J. F. Smith, vice-president, has purchased the business for many years conducted by C. E. Freeman at 1213 Broadway and 18 San Pablo avenue, Oakland, Cal. Mr. Smith until recently was president and general manager of the Pierce Hardware Company, and has been a resident of Oakland for over 35 years, during 23 years of which he has been actively engaged in the Hardware trade. Mr. Browne was formerly secretary of the Jupiter Steel Works in San Francisco, having been with that company for 15 years. The new company will carry a full supply of goods usually found in a first-class Hardware store and will make a specialty of Builders' Hardware.

ON May 1 William Fletcher & Sons, Limited, assumed control of the business which had been carried on for so many years under the name of Udal, Sons & Symonds, factors and manufacturers, Birmingham, England.

THE ONE-PRICE STORE

BY CLARFIELD.

HOW many Hardware merchants are there in the country who still follow the antiquated method of marking goods in cipher and selling them for any price they can obtain? Although the method is beyond all question unbusinesslike, there are to be found a good many Hardware stores struggling along with this handicap.

This old plan is detrimental to the best interests of any business in these days of keen competition and alert progressiveness.

Causes Lack of Confidence.

The day has passed when clerks and merchants can hold a personal following by showing favoritism—or apparent favoritism—and "throwing off" a little from regular prices in order to make a sale. Such methods, though prevalent 15 or 20 years ago, have outlived their day of usefulness, and were always questionable. The public has learned that when it buys goods marked in cipher it is "buying a pig in a poke." Retail buyers have come to a stern realization of the fact that in such transactions they are placing themselves entirely at the mercy of the integrity—or the lack of integrity—of the seller. The system has been so much abused in the past that the customer becomes at once skeptical if he is offered a discount from a cipher price, no matter if he knows the clerk or merchant in question to be honest and honorable.

So to-day the cipher system works harm. The stores marking goods in plain figures are the ones which are making the desirable business gains.

Mark in Plain Figures.

One of the most common objections of the old line merchant to this new system is that it gives his competitors an open opportunity to obtain and to meet his selling prices. Particularly will this plaint be heard outside of the large cities. But it is mighty backward competition that will not obtain these facts under any condition.

Mark all goods in plain figures. Do not make price concessions to one person unless they are made to all.

In case of special advertised sales, goods should be reduced in price for the period advertised only. There are many staple lines which are seldom if ever advertised, and which never need to be changed in price if they are originally marked at a price which meets competition. Such goods need to be marked down only when closing out shopworn samples or broken lines.

Good Buying.

Every merchant is familiar with the old adage, "Well bought, half sold." That's one thing that will never wear out in business. It was a live proposition twenty years ago and it is very much alive to-day. If competitors are underselling you it is not often safe to conclude they are going into bankruptcy. Perhaps they have bought to better advantage, and are making more profit than you are, and still selling at lower figures.

It pays to know. You have got to know if your enterprise is going to float upon the present high seas of competition.

THE NEW RETAIL STORE OF RICE & MILLER.

RICE & MILLER, Bangor, Maine, have recently fitted up exclusively for the retail department of their business the building adjoining the one which they have occupied since 1885. For more than 87 years a Hardware business has been conducted under many proprietors on the site of the latter building. Both stores are 20 x 90 feet in size, and the new salesroom shown in the illustration has been fitted up with modern fixtures throughout. Two rows of electric lamps attached to the ceiling extend the entire length of the room. The cashier is located near the rear of the store, with a cash carrier system reaching out to convenient points. Here also are the private offices of Mr. Rice and Mr. Miller, and so located that it is easy to go from them to any portion of the building, and keep in close touch at all times with their large force of employees. Upstairs one entire floor is devoted to the Paint department, the arrangement of which is such that the filling of orders is rendered easy and efficient. The old store is now devoted entirely to the wholesale department of the business, with the accounting room and clerical force in commodious quarters in the rear. In connection with the refitting of the new store a two-story annex, 40 x 60 feet, was erected in the rear, extending the whole length of the wharf to the river. Under the present arrangement the firm controls the entire four stories and basement of the two stores, the basements under the neighboring stores on both sides, the large warehouse mentioned above, a smaller one and a warehouse on an adjoining street, which is 60 x 120 feet, having two stories and basement. These warehouses greatly facilitate the receiving and shipping of freight. The lines of goods carried by the firm include Shelf and Heavy Hardware, Oils and Paints, Sash, Doors, Mantels, Tile, Firearms and Ammunition, Lumbermen's and Railroad Supplies, Lubricating Oils, Powder, Dynamite, &c.

The New Retail Store of Rice & Miller.

AMONG THE HARDWARE TRADE.

Rutledge & Schulte have bought the Hardware business formerly conducted by Benepe & Owenhouse Company, Belgrade, Mont.

McMillan & Hedrick, Madill, I. T., have been succeeded by the J. E. McMillan Hardware Company, which will continue the Hardware, Stove, Paint, Implement and Sporting Goods business at the old stand.

The Griffith Hardware & Plumbing Company, Idaho Falls, Idaho, is about to open a branch establishment at Twin Falls.

George F. Deyo, who has managed the store for the past ten years, has succeeded his father, Ira N. Deyo, in the Hardware, Paint and Implement business at Honeoye, N. Y.

J. W. Johnson has bought the Hardware, Implement, Paint and furniture business of M. Metz in Alters, Ark.

Furbush Hardware Company, Marshalltown, Iowa, has been incorporated with a capital stock of $8000.

E. P. Hood has sold his Hardware, Stove, Implement, Paint and Harness business in Pratt, Kan., to the H. & K. Hardware Company.

McGuire-Tymeson Company, Johnstown, N. Y., has been organized to conduct the general Hardware business. The members of the firm are James H. McGuire, Arthur A. Tymeson and Patrick F. McGuire, the latter formerly with E. G. Bachellor & Co., Gloversville, N. Y.

Rimstidt Hardware Company, incorporated with a capital stock of $8000, has succeeded Rimstidt Brothers, Rockport, Ind.

Frank J. Prucha is successor to Kovarik & Prucha in the Hardware, Stove, Paint and Sporting Goods business at Howells, Neb.

J. L. Hight & Co., Muldron, I. T., have disposed of their Hardware and Implement business to A. J. Stewart, who continues at the old stand.

A. M. Brann has sold his interest in the Hardware firm of McProud & Brann, South Haven, Kan., to G. K. McProud, and the business will be continued under the style of McProud Brothers.

THE CHAPIN-STEPHENS COMPANY, manufacturer of Rules, Planes, Levels, &c., with main office and factory at Pine Meadow, Conn., has, since its consolidation in 1901, conducted a New York store. Until his death this was under the personal management of Virgil P. Humason, who was also a director and vice-president of the company. The store until recently was located at 80 Chambers street. Shortly prior to the sudden death of Mr. Humason on May 6 the store was removed to 9-15 Murray street, where much better facilities are afforded in the way of commodious offices, sample and stock rooms. The new manager is John E. Humason, son of V. P. Humason, who had been associated with his father during the past 12 years. Mr. Humason will also look after his father's interests in Silver Ware and other lines that he was handling at the time of his death.

THE SMITH-ECHOLS-BURNETT HARDWARE COMPANY, Gadsden, Ala., is about to build a modern three-story structure to be used for Hardware purposes. The building will have a frontage of 125 feet and will be 75 feet deep. The company expects to occupy it about November or December of this year.

CONTENTS.

PAGE.

Motor Drives in the Plant of the John Simmons Company. Illustrated 1653
The Buffalo Foundrymen's Association 1657
A Life Insurance Question in Bankruptcy 1657
Ore Handling Plant at Conneaut, Ohio. Illustrated 1658
Steel Castings for Blackwell's Island Bridge. Illustrated 1661
The World's Supply of Iron and Ore. Illustrated 1662
The Schoen Steel Wheel Company 1664
Reciprocity, an Economic Policy 1665
Puddled Iron Versus Soft Steel. Illustrated 1666
The New Fosdick Sixteen-Inch Engine Lathe. Illustrated 1667
Ore Explorations Promise Activity 1668
The Bertrand-Thiel Process 1670
Motors Adapted to Belt Driven Machines 1672
Pacific Coast Trade Prospects 1672
Federal Control of Freight Rates 1673
The New Amalgamated Scales 1677
Sir Bernhard Samuelson Deceased 1680
Statue of Abram S. Hewitt. Illustrated 1680
Obituary 1681
Personal 1681
Editorial:
Don't Get Blue 1682
The English Pig Iron Warrant Market 1682
A Successful Arbitration 1683
The Amalgamated Association Elects New Officers 1683
The Myersdale Sheet Steel Company 1683
The National Association of Manufacturers 1684
Steel Rails for Fast Lines 1685
News of the Works:
Iron and Steel 1687
General Machinery 1687
Power Plant Equipment 1688
Foundries 1688
Bridges and Buildings 1688
Fires 1689
Hardware 1689
Miscellaneous 1689
The Iron and Metal Trades:
A Comparison of Prices 1690
Chicago 1690
Philadelphia 1692
Cincinnati 1693
Birmingham 1693
Pittsburgh 1694
Cleveland 1695
New York 1696
An East Indian Projected Iron Industry 1697
Iron and Industrial Stocks 1697
Metal Market 1697
The Machinery Trade:
The New York Machinery Market 1698
New England Machinery Market 1700
Chicago Machinery Market 1701
Philadelphia Machinery Market 1702
Cincinnati Machinery Market 1703
Government Purchases 1703
New York Pig Iron Warrant Market 1705
Labor Notes 1705
Trade Publications 1705
Hardware:
Condition of Trade 1706
Notes on Prices 1707
Michigan Retail Hardware Dealers' Association 1709
East Asian Mercantile Company 1709
Carver File Company 1709
The One-Price Store 1710
The New Retail Store of Rice & Miller. Illustrated 1710
Among the Hardware Trade 1711
Victorian Hardware Assistants' and Trade Association 1712
Arkansas Retail Hardware Association 1712
Requests for Catalogues, &c 1712
Trade Winning Methods. Illustrated 1713
Factory Cost and Business Methods 1715
British Letter 1716
McLendon Hardware Company's New Building 1717
Lisk Mfg. Company's Catalogue 1717
Price-Lists, Circulars, &c 1717
Keuffel & Esser Company 1717
Headson Never Slip Wrench. Illustrated 1717
The Anchor Flower Bed Guard. Illustrated 1718
The I. M. E. Gas Heated Sad Iron. Illustrated 1718
The Taylor Self Locking Clamp. Illustrated 1718
Solid Frame Double Action Revolvers. Illustrated 1718
The Jeffords Floor Clamp. Illustrated 1719
Current Hardware Prices 1720

VICTORIAN HARDWARE ASSISTANTS' AND TRADE ASSOCIATION.

AN interesting and quite successful trade organization is the Victorian Hardware Assistants' and Trade Association, with club rooms and offices at 285 Collins street, Melbourne, Australia. This association while consisting principally of employees also embraces a number of employers, and we understand that much general good has resulted from its work and that there is the most harmonious relationship between the two classes.

The association has now been in existence for 12 years, having been established in 1893. Among its objects as related in the association booklet are the following:

The mutual improvement, promotion of good fellowship and development of the musical and elocutionary abilities of its members.

Provision of a register for situations, vacant and wanted.

Rendering of assistance to members temporarily in distress.

Furthering the interests of all assistants in the Hardware trade.

Those desiring to become full members of the associa-

The Association Badge.

tion must comply with one of the following conditions to be eligible:

1. A person at present, and one who has been for the previous six months, employed by a recognized Hardware house.
2. A person formerly a recognized ironmonger, or employed by a Hardware house for a period of three years, and at present working at a trade affiliated with ironmongery.
3. Persons employed in the following trades as salesmen shall be eligible for membership: Blacksmiths, plumbers, gas fitters, tool makers, brass finishers, coppersmiths, braziers, tinsmiths, iron workers, locksmiths and metal workers.
4. Representatives or agents of Hardware manufacturers and their employees.
5. Employees of firms termed general providers or store keepers, who have a special department for the sale of general ironmongery, and who are solely employed in that department.
6. All persons must be over the age of 18 years.

Those debarred by the above conditions may join as club members, the others being known as association members.

The entry fee is 2 shillings 6 pence, the rates of subscription per annum being 10 shillings 6 pence for senior members and 5 shillings for junior members. The club members, who need not be identified with the trade, pay the same annual dues as the senior members.

Entertainment and Recreation.

The club rooms are situated in the very heart of the city and are comfortably furnished and replete with every convenience. Special thought is given to the entertainment and recreation of the members, the more formal occasions including concerts, smokers, euchre and billiard tournaments, &c. A series of "house nights" has recently been inaugurated. These are miscellaneous entertainments provided once a month by the employees of a certain house. The first occasion of this sort was held on March 29, when the employees of John Danks & Son furnished the programme of the evening. The affair was a marked success and the members are looking forward with much satisfaction to the gatherings to come. A series of lectures on topics connected with the trade has also been arranged for the winter months, the first of the lectures being given during the present month. In the way of outdoor amusement the association has an annual picnic, which this year was held on March 4, and the annual sports, which took place on April 8, the latter being held at the Melbourne Cricket Ground, where many valuable prizes and trophies were competed for.

A very valuable feature of the association work is the employment bureau, through which hundreds of positions throughout Australia have been secured for those desiring them. Since the first of the year 35 new members have been taken into the association.

The president of the association is D. J. Chandler, who has recently passed through the United States on a trip around the globe and is now on the Atlantic bound for England and the Continent. Mr. Chandler is an enterprising and successful merchant in Fitzroy, one of the suburbs of Melbourne, and is combining pleasure with business on his tour.

ARKANSAS RETAIL HARDWARE ASSOCIATION.

THE recent Arkansas Legislature, which has just adjourned, threw some wise restrictions around the mutual fire insurance laws of that State, and the Arkansas Retail Hardware Dealers' Association purposes to take advantage of the fact and to organize its own mutual Hardware fire insurance company. This will doubtless be the means of saving some money in premiums to the members of the association. The matter will be fully considered at the coming annual convention, which will be held in Little Rock, June 21, 22 and 23, it being in the hands of a committee appointed at the last convention.

The coming meeting will be the largest yet held by the association. Many new members have come into the fold during the past year, and many jobbers, manufacturers and traveling men will be present. An attractive programme has been arranged, and in addition to the business sessions there will be many courtesies extended the convention in the way of entertainment while in Little Rock.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers, price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses, and are referred to the manufacturers:*

FROM FRANK HAND COMPANY, Elizabeth, N. J., which especially requests printed matter relative to specialties in Hardware, Wood and Willow Ware, household furnishings and Painters' Supplies.

FROM JAMES J. SMITH, Griffin Corners, N. Y., who has just opened up as a retailer of Shelf and Heavy Hardware, Stoves, Agricultural Implements, &c.

FROM THE MUNSON-BOSTROM-SAMUELSON COMPANY, Bristow, Neb., which has succeeded Erickson-Munson Company in the Hardware, Stove, Implement, Paint and Sporting Goods business.

FROM C. T. LEE, Chautauqua, Kan., who has lately opened a store for the sale for Shelf Hardware, Stoves, Tinware, Paints, &c.

THE State of Illinois passed a bulk sale bill during the recent session of the Legislature. This bill was strongly recommended by the State Hardware Association. It prevents the sale of a stock of goods or any considerable portion thereof by a merchant without five days' notice being given previously to his creditors.

WILLIAM S. MATTLEY has bought the Hardware, Stove, Implement, Paint, Harness and furniture business formerly conducted by E. A. Butler & Co., Ansley, Neb.

TRADE WINNING METHODS.

This department is for the description of approved methods of carrying on and extending business, and a cordial invitation is given to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

A LIVE POSTER.

ONE of the latest illustrated posters issued by Evenson Bros., St. Peter, Minn., whose name and address at the bottom of this appeal for business are coupled with the remark that they are "Live Hardwaremen, who are Willing to Divide Their Profits With You," contains the following query to buyers in their territory:

Do You Patronize Catalogue Houses?
Are you thinking of buying a buggy from them?
Here is Our Proposition:
Come and see our stock, and if we cannot show you that our jobs are superior to the catalogue jobs, dollar for dollar, we will order the catalogue job and pay the freight. Will you put us to the test?

The poster also calls attention, with prices, to Lawn Mowers, Fencing, Refrigerators, Stoves, Boys' Wagons, Fishing Tackle, &c. The Stove chapter is headed "A Timid Woman Can Use This Stove," which, it is stated, "lights just like you light a lamp—no generating, no smoke—no puffing or flaming up—one motion starts the Stove, another puts it out." The price of the two-burner size is given at $8.50; of the three-burner, $11. Their Hog Fence is described as "26 inches high, weighs 9 pounds to the rod; will not sag or break and will turn any animal." In bold faced type appears the price, "26 cents per rod." The poster is about 15 x 21 inches in size.

MANUFACTURERS SUPPLYING CUTS FOR RETAILERS' ADVERTISEMENTS.

A RETAIL hardwareman recently received a letter from a Cutlery manufacturer in which the latter asks the privilege of sending the retailer an electrotype of his goods, for use in the retailer's local papers. At the outset, it should be stated that manufacturers who supply the trade with electros and advertising matter are to be commended as doing a very wise thing. The trend of business enterprise is unquestionably toward advertising, and the wise manufacturer will help the retail merchant in every way in his power. In the case under consideration the manufacturer advertised the goods to the public in magazines and journals having a wide circulation. These advertisements were strong and forceful and orders secured by the manufacturer were referred to the retailers from whose territory they emanated. This is an admirable illustration of fair and liberal dealing with the local trade.

The cuts, however, which the manufacturer proposes to send out are half-tones and will not reproduce at all satisfactorily in the ordinary newspaper. The merchant will therefore do well to ask the manufacturer to send line cuts of the illustration, upon receipt of which the advertisement in question can be used, the local newspapers setting up the type matter. At the same time it would be both courteous and businesslike to thank him for his up-to-dateness and his eminent fairness.

Now, considering the matter more generally, it should be borne in mind that retailers, no matter how good the local newspaper may be, cannot ordinarily afford to use fine screen illustrations. Few newspapers, especially in the smaller places, can reproduce half-tone cuts. Consequently, the publisher prefers his advertiser to use cuts made from line drawings rather than cuts made from photographs. In a line cut every line shows distinctly and the object aimed at is gained. If half-tones are used a blurred, blotchy effect will generally result.

An advertisement full of argument why the featured article should be bought will usually be more effective than pictures, unless they are useful as illustrations of the goods. Of such an advertisement the following is an example:

CLEANING UP DISEASE

When the cloak of winter covered the ground it covered, too, the dying and the decaying vegetable matter of the preceding season. This refuse matter has lain under the snow and now its destruction is complete. It has rotted, and what was once vitality is now first-class fertilizer. But only when the vegetable substances sink into the soil do they form fertilizer. If decaying vegetable matter be allowed to stay on top of the ground it makes disease breeding corruption. It then dries up and floats off in the air, to become a disease causing germ. Then, too, vegetable matter shelters infinitesimal animal life. When this decays a positively dangerous germ is unloosened. Physicians agree on these points. Therefore, one's only safeguard is to get vigorously busy with rake, hoe and spade, turning surface earth under, and while clarifying the air to also enrich one's soil, as well as making good garden ground. And, too, one's only safeguard is to buy good garden tools of the old reliable

Dudley Hardware Store
Johnson & Williams, Prop.
260 Main St., Pokeepsie, N. Y.

The advertisement, as reproduced above, sold Garden Tools. Since that was its object the advertisers are satisfied and it deserves general commendation, while at the same time it illustrates the efficiency of advertising in which attention is called in a reasonable, direct way to the goods in question.

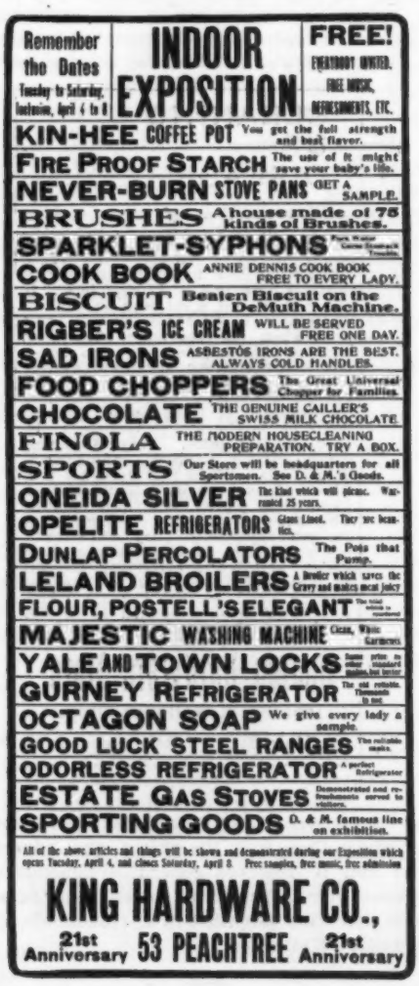
POSTER FOR MAY.

"MAY MAGNETS" is the title of the yellow poster issued for the present month by E. M. Austin, Litchfield, Ill., who refers to his prices for May as having been "squeezed to the thinness of tissue paper." As usual the poster is illustrated and covers a large variety of goods. A feature of the poster is an alphabetical list of spring needs in the Hardware line, with prices, which are referred to as for goods of high quality. Some of the articles and prices thus quoted, taken at random, are as follows:

Axle Grease, box	5c.
Bowls, Chopping	15c.
Bolts, Carriage, doz	5c.
Broilers, Tinned Wire	10c.
Brushes, Window	50c.
Buggy Whips	10c.
Cuspidors, Granite	25c.
Cans, Milk, extra heavy, 8-gal	$1.85
Coffee Mills	45c.
Clothes Lines, cotton, 50 feet	15c.
Hose Sprinklers	$1.00
Hose Nozzles	50c.
Hose Reels	65c.
Hinges, Spring, per pair	10c.
Hammers, Nail	50c.
Kettles, Preserving	25c.
Locks, Sash	5c.
Pans, Roasting	45c.
Pans, Frying	15c.
Paints, Ready Mixed, quart	45c.
Rakes, Lawn	45c.
Step Ladders, 6 feet	80c.
Spring Balances, 24 pounds	15c.
Wire Stretchers	70c.

TRADE-WINNING "INDOOR EXPOSITION."

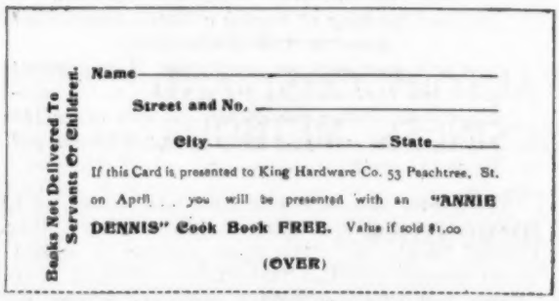
KING HARDWARE COMPANY, with main house and two branch stores in Atlanta, Ga., and also branches at Columbus and La Grange, Ga., and Stove foundry at Sheffield, Ala., recently concluded what was termed an "Indoor Exposition," in honor of the company's twenty-first anniversary. The exposition was given at the headquarters of the business on Peachtree street, Atlanta, for a week, another week being divided equally between the Whitehall street, Atlanta, store, and the Columbus establishment.


Remember the Dates
Tuesday to Saturday, Inclusive, April 4 to 8
INDOOR EXPOSITION
FREE!
EVERYBODY INVITED. FREE MUSIC, REFRESHMENTS, ETC.
KIN-HEE COFFEE POT You get the full strength and best flavor.
FIRE PROOF STARCH The use of it might save your baby's life.
NEVER-BURN STOVE PANS GET A SAMPLE.
BRUSHES A house made of 75 kinds of Brushes.
SPARKLET-SYPHONS
COOK BOOK ANNIE DENNIS COOK BOOK FREE TO EVERY LADY.
BISCUIT Beaten Biscuit on the DeMuth Machine.
RIGBER'S ICE CREAM WILL BE SERVED FREE ONE DAY.
SAD IRONS ASBESTOS IRONS ARE THE BEST. ALWAYS COLD HANDLES.
FOOD CHOPPERS The Great Universal Chopper for Families.
CHOCOLATE THE GENUINE CAILLER'S SWISS MILK CHOCOLATE
FINOLA THE MODERN HOUSECLEANING PREPARATION. TRY A BOX.
SPORTS Our Store will be headquarters for all Sportsmen. See D. & M.'s Goods.
ONEIDA SILVER The kind which will please. Warranted 25 years.
OPELITE REFRIGERATORS Glass Lined. They are beauties.
DUNLAP PERCOLATORS The Pots that Pump.
LELAND BROILERS A Broiler which saves the Gravy and makes meat juicy
FLOUR, POSTELL'S ELEGANT
MAJESTIC WASHING MACHINE Clean, White Garments
YALE AND TOWN LOCKS
GURNEY REFRIGERATOR The old reliable. There's no better. It's not.
OCTAGON SOAP We give every lady a sample.
GOOD LUCK STEEL RANGES
ODORLESS REFRIGERATOR A perfect Refrigerator
ESTATE GAS STOVES Demonstrated and refreshments served to visitors.
SPORTING GOODS D. & M. famous line on exhibition.
All of the above articles and things will be shown and demonstrated during our Exposition which opens Tuesday, April 4, and closes Saturday, April 8. Free samples, free music, free admission
KING HARDWARE CO.,
21st Anniversary 53 PEACHTREE 21st Anniversary

Indoor Exposition Ad, Four Columns in Width and Running the Full Length of the Page.

During the exposition a good deal of newspaper advertising was carried on, two striking specimens of which are reproduced, very much reduced, herewith. The Booth and Space ad occupied the upper half of a seven-column page, the remainder of the page containing mostly news of the day. The other ad was four columns in width, running the full length of the page, and was also given place on a page in which it divided attention with the news.

The exposition was well attended throughout. While sales during its continuance were not increased a great deal, a very material growth in business has since been noted, and several hundred new customers have been added to the company's list. The merits and advantages of a number of specialties were constantly demonstrated, appetizing refreshments were provided, and there was a fine musical programme.


Books Not Delivered To Servants Or Children.
Name
Street and No.
City State
If this Card is presented to King Hardware Co. 53 Peachtree, St. on April . . you will be presented with an "ANNIE DENNIS" Cook Book FREE. Value if sold $1.00
(OVER)

Cook Book Card for the Ladies.

Each of the woman visitors was presented with an "Annie Dennis Cook Book," the regular price of which is $1, provided she made application for it, as per blank, one day, and returned the blank filled out as directed the next. The face of this blank, reproduced about one-half, is given above.

On the back of the blank appeared the following requests for information, appropriately spaced:

Please write a suggestion to benefit us.
Your criticism of service, stock and prices.
What do you think of our Indoor Exposition?

Over 5000 pleasant compliments were thus received, together with many valuable suggestions.

A. B. Ware, the enterprising and efficient manager of

WHAT YOU SEE AND GET AT THE EXPOSITION
1884 KING HARDWARE CO. 1905
Booth No. 1.
Size 8x10 feet, covered with chains, entire back and ends made solid of Yale and Town famous line of locks. This exhibit alone is worth a trip to Atlanta, if you live even out of the state
"YALE LOCKS ARE THE BEST."
Booth No. 2.
Majestic Washing Machine will occupy Booth No. 2. This machine is designed to save time, money and clothes. We will endeavor to prove to you.
We recommend OCTAGON SOAP, will give every caller a cake free.
Booth No. 3.
Will be made entirely of White Broom, Scrub Brushes, Dust-proof Brushes, etc. Our Demonstrator will endeavor to prove their good quality and our low prices.
Booth No. 4.
Good Coffee is what most of us like. We will have an expert coffee maker to show the merits of King Hill Pot.
COFFEE FREE TO EVERYBODY
Booth No. 5.
Dunlap Percolators need no introduction in Atlanta, you all know the merits of a Dunlap.
We will serve coffee free to all visitors made on Dunlap, from the famous GOLDEN ARROW COFFEE, sold by Hill Tea and Coffee Company.
Booth No. 6.
Booth No. 6, size 5x12 feet, will be used to demonstrate the best food and vegetable Chopper now on the market. Every housekeeper, married or single, are cordially invited to ask questions and buy a Universal Food Chopper.
"Grind your food and prolong your life."
"Universal."
Booth No. 7.
The strong points of the "Opelite" Refrigerator will be shown you at Booth No. 7. The Opelite is glass lined, aluminum shelves, made of highly polished oak, one inch thick. The best high grade Refrigerator made
Prices $30.00 to $100.
See how cold it is.
Booth No. 7.
Our Demonstrator will show you our "Sparklet Syphon," why you should not drink river water with one million germs to every gallon.
We carbonate water in a Syphon at less than ½c glass.
Can you afford not to have pure water?
Booth No. 8.
ANNIE DENNIS COOK BOOK
We will present every lady with a Cook Book free. Value if bought would be $1.00.
We recommend FIRE PROOF STARCH. Sample box to every lady.
Space No. 9.
Oneida Community Silver, every piece warranted 25 years. We will display everything known in flatware.
Every caller should have some "Aveland" Silver.
25 year guarantee
Space No. 10.
We put on, display the best broiler ever made. Those who try them come out with a smile.
We will demonstrate the Leland Broiler on our King Steel Range.
Booth No. 11.
Gurney Refrigerators, the old reliable. We sold last year eight solid cars of Gurney Refrigerators. Have sold them for years, never had one returned.
Our Demonstrator will show you six good points.
Booth No. 12.
The "Odorless" Refrigerator is known in Atlanta and adjoining states, almost as well as Gov. Washington.
The "Odorless" is a very fine and durable Refrigerator.
See our Demonstrator
Space No. 14.
We wish to call special attention to our "GOOD LUCK" STEEL RANGE, which will be demonstrated. You will notice the simplicity, the even heat.
POSTELL'S ELEGANT FLOUR will be used, which is proof of good bread and beaten biscuits. Try one
Space No. 15.
Our Estate Gas Range will be demonstrated by an expert Gentleman Cook from Cincinnati, who will bake Angel Food Cake every day, and take pleasure in showing our visiting friends how to do it.
To Our Customers and Friends:
We cheerfully recommend to you—
Postell's Elegant Flour
Octagon Soap,
Fire Proof Starch.

Indoor Exposition Ad, Occupying Half a Page.

the company, originated the "exposition" idea last fall, when the first was held. This exhibit was given on modest lines and proved so successful that the one just concluded was conducted on a much larger scale.

ANNUAL CATALOGUE.

KING & WEAVER, Hardware merchants, Ligonier, Ind., have issued a well-printed catalogue of nearly 50 pages, the early part of which is devoted to their line of Stoves and Ranges. Fencing, Refrigerators, Hay Tools, Sewing Machines, Paints, Varnishes, Household Utensils, Seeds, &c., also come in for attention, a number of testimonials from pleased purchasers of the firm's Stoves concluding the catalogue. The catalogue was circulated by delivering one to each house in the town. People on the rural routes and in small towns nearby were reached through the mails. The firm advises us that it has every reason to feel gratified with the results following the issue of this its first annual catalogue.

FACTORY COST AND BUSINESS METHODS.

SYSTEM vs. COMMONSENSE.

BY A. J. TIZLEY.

SYSTEM is a most necessary thing in business. Two or three boxes of cards, a few loose leaf books, the same properly manipulated, and one mind can control the movements of many. System is also a great fad. Some people talk system without understanding, still others understand, but do not practice it. There is nothing so ludicrous as the systematic business man with his trays of cards and row of pigeon holes in which he has a place for everything. The trouble is he seldom puts anything in its place. Neither he nor any one else can usually find in less than an hour's time into which part of his system he has put things. The simplest system takes a systematic person to keep the same in order.

From Bad to Worse.

The writer has in mind a large establishment run in an old fashioned way; the owners desired to become up to date and, after going over the matter thoroughly, arranged to get the best man money could procure for the position of general manager. The man selected was really a systematic man; he understood system very thoroughly (?). When he took charge of the old fashioned business and had looked into its old fashioned ways he was horrified, and immediately started to write up a system. He wrote up various forms of cards of the standard sizes (3 x 5 and 4 x 6, &c.), and ordered the same of the standard colors with various printed forms thereon, together with a number of card filing cases, and loose leaf books, with special forms of printed loose leaves for the same. The system was installed in due time; each clerk was given some particular part of the same, and the manager kept what was supposed to be the key to the system, and then things began to happen. The clerks and heads of departments got their cards, &c., mixed up in bad shape within a week, the manager lost all track of the various branches of his system, or, in other words, lost the key to the situation, bringing to mind an article the writer read recently, as follows: "We have an index card for each thing to do, and everything under the sun. It takes so long to fill out the cards we never get anything done. We have loose leaf ledgers for saving time, but the Lord knows what they cost when half our time is spent each day hunting for leaves that are lost." This state of affairs continued for about a month, at the end of which time everything was in confusion, and even the work in the factory practically at a standstill. The succeeding manager upon taking charge threw out this entire system, and installed another that was practically the old time method, simplified, without unnecessary cross references, and with the addition of some loose leaf books and a not too elaborate system of cards. One great thing the directors overlooked when they engaged the preceding manager was the fact that while he was a thorough technical man and a scholar he was not practical in their particular line of business. His system was theoretically correct, but practically impossible; furthermore, he had not the executive ability properly to install his system, nor to discipline those who handled the various parts of the same.

Unmasking an "Auditor."

We have been annoyed from time to time with a number of circular letters from a certain house and, not having paid any attention to the same, the manager of this concern favored us with a personal call. This gentleman was a very aggressive person, possibly 22 years old, and had considerable to say about the cost and general office systems of the different large manufacturing concerns of our city. After a little cross questioning we found that this young man was the entire auditing company, that his knowledge of business methods was limited to possibly a six months' course at night school and that his experience as an auditor was gained in an office where he had the honor of licking the postage stamps and applying the same to envelopes containing the firm's correspondence. It is just such concerns as this, which have nothing to lose and everything to gain, that are reorganizing and systematizing (?) some of our old and out of date manufacturing establishments.

There is no one quite as tiresome to listen to as the successful business man that has made his money as a wholesale peanut merchant, and who can see no reason why the system he used in his office and warerooms cannot be applied equally well to the concern that manufactures an endless variety of brass goods.

We were quite anxious recently to obtain a book on system that was recommended to us as being the most practical thing published, and advertised by a most aggressive and systematic concern. We inclosed the price of the book in a folder sent us for that purpose and naturally expected to receive the book from such a systematic and thoroughly practical concern within at least a week, but, strange to relate, after writing four letters and sending one telegram "collect," and receiving in reply at different times within the following two months four different form letters, supposedly signed by three separate individuals we had to call upon the representative of our firm in the city where the book was published to call upon and demand of the publishers our copy of the same. This our agent did, and upon the same day we received the book forwarded by our representative we also received another from the publishers. This is one illustration of the many so-called systematic institutions.

More "System"

Another illustration of an expensive but ineffective system in a different line of manufacture: We wrote to several manufacturers of desks for a catalogue. One of these concerns to whom we wrote answered very promptly by means of a form letter giving their terms, discounts, &c., stating that they had sent their catalogue under separate cover. This catalogue did not come to hand in due time, so we wrote again. We received a personal letter this time, wherein it was stated that they had forwarded a copy of the catalogue under separate cover, which, by the way, came to hand, and also that they had inclosed a stamped envelope for reply. This they did not do. We ordered a desk and chair from them, and in due time received the desk by freight from a considerable distance, without the chair. We were much exercised over this and wrote these people to cancel the order for the chair. In about a month we received a letter from them saying that they had neglected to ship the chair and had canceled the order for the same. Two days prior to the receipt of this letter we received the chair by freight. It certainly seemed in this particular case as if there was a lack of system between departments, and that while their follow-up system was all right theoretically it was not in charge of a practical or

systematic person. It possibly had all been left to the care of the office boy.

One Reason.

The mere fact that a man is self made, and has risen from an immigrant to the presidency of a concern does not imply that his will is law and that while system is essential to the conduct of all other members of the firm it must not interfere with his movements, and yet this is one reason system is impossible in many concerns.

Any system to be effective must be simple, not to tend to isolate the various executive departments of a concern. It must so interlock that when any part or section is mismanaged or goes wrong it will automatically block itself until righted, and, above all else, no system that tends to delay correspondence, the prompt entry of orders and shipment of the product should be installed. If time is money the loss of time is money lost. Much is written of late on shop costs under such scare headings as "Stop That Leak," &c. The professional systematizer usually gets at it by driving a plug that costs $5000 a year into the $1000 a year leak. There is more or less leakage in every business, particularly so in manufacturing establishments, and a little system will do much to lessen these losses if properly installed.

BRITISH LETTER.

Offices of *The Iron Age*, HASTINGS HOUSE, NORFOLK STREET, LONDON, W. C., May 13, 1905.

The State of Trade.

THE four months to the end of April have seen an expansion of 7.05 per cent. in the value of our exports, and on the whole the figures which show this result are healthy; but exports, we have been taught, form but a small proportion of our total trade, and moreover it is recognized that increasing exports may indicate stagnation of home trade. The theory is that when British markets are dull and the demands of the population are restricted, merchants and manufacturers are forced to find abroad the outlet for that portion of their produce not wanted at home. The increase in exports therefore prompts an inquiry as to whether this State of things exists, and whether the hopes of a few months ago are being wholly fulfilled. At once it may be confessed that oversanguine persons have been doomed to disappointment, for although there has been considerable revival in some of the large staple industries, others which minister to the everyday wants of the population have experienced only a slight improvement, and the reports from travelers have not been very encouraging. Apparently consumers are not in a much more favorable position. The hoped for remission of taxation has not come into operation, and when it does come it will be trivial. We are to pay more to our national creditors rather than relieve the pressure on our pockets, which, though it may be sound finance, is not very encouraging for the present.

It is difficult to find in statistics any adequate measure of the condition of the home trade, but railway traffic returns and bankers' clearances are regarded as a reliable index. The traffic returns, unfortunately, are not very encouraging. During the first four months of the year most of the important railways have fared badly. There is a net decline of £121,089 in the income furnished by the movement of commodities to the seven chief railways of this country. This is a discouraging condition and it is more so when it is remembered that a part of the total income of these railways represents goods sent to the coast for export. Taking into consideration the fact that exports are increasing, the movement of home trade would appear to be even less favorable than the figures reveal. It may be thought that the experience of these companies has been unfortunate, but such uniformity of bad results can hardly be explained away in that manner, and if 17 of the principal English and Irish lines are taken the revenue from passengers and merchandise combined exhibit a decrease of £122,450.

When the inquiry is carried further, however, a contradiction is presented. There is no sign of diminished trade in the Bankers' Clearing House figures. So far this year there has been an expansion equal to 18.35 per cent., as compared with the corresponding period of the past year. If the comparison is narrowed down to the clearings on the fourths of the months, then the result is scarcely less favorable, for on those days of essentially trade clearings there has been an increase of just over £19,500,000, or 14.08 per cent. Provincial clearings are not all favorable, but in the case of Manchester there has been an increase of more than £3,500,000, or 4.36 per cent., and in the case of Birmingham one of just over £500,000, or 2.98 per cent. The other three clearings present the following decreases: Liverpool, £11,757,000, or 15.52 per cent.; Newcastle-on-Tyne, £346,100, or 1.30 per cent., and Bristol, £239,300, or 2.23 per cent. Possibly the difference in the Liverpool figure may be very largely due to the substantial fall in the value of raw cotton. The other two declines are comparatively small, and considering the aspect of the remaining totals the bank returns are encouraging.

In the end it has to be confessed that the result of the two sets of facts is inconclusive. They are too mutually destructive to permit any decisive lesson to be drawn from them as to the actual state of the home trade, but at least it seems beyond dispute that the progress made is not so great or so widespread as had been anticipated. It is to be hoped that what little movement there has been will gain in strength and volume during the remaining two-thirds of the year, though with the drain of national and municipal demands and the consequent necessity for economy felt in almost every direction the rate of growth must necessarily be impeded.

Hardware Exports.

The quantity of Hardware exported last month was 63,428 hundredweight, as compared with 59,034 hundredweight in April of last year, and the total exports of this nature for the four months of the current year amount to 262,008 hundredweight, showing an increase of 52,622 hundredweight upon the figures for the corresponding portion of last year.

Sheffield Cutlery Trade.

The Cutlery exports for April are again unsatisfactory reading. The total was £49,563, against £50,947 for the same month last year, and the exports for Cutlery, Hardware, Implements and Instruments were only £400,929, against £404,078 for April, 1904. This falling off shows that there has not yet been any turn in trade and that the depressed state of affairs still continues. The only satisfactory feature of the figures is that the exports to Canada, Australia and other colonies show an increase, and Cutlery manufacturers are looking for good business with these places when an improvement in trade sets in. In Germany there is a dispute as to wages, and if this extends Sheffield makers may benefit to some extent. Manufacturers of good quality Scissors have recently booked a few good lines. Sheffield does not to-day, or, at any rate, only to a small extent, make the commoner classes of Scissors, but in best and medium quality goods she still retains a good hold on the markets.

Private Traders and the Co-operative Movement.

In the North of England, where the co-operative movement is so strong, constant friction occurs between private traders and the co-operators. There are always, in some part or another, energetic protests. Thus, at a meeting of private traders held near Sheffield last week, we have the case stated for the private trader by the chairman, who said that he had never denied the right of people to combine to supply themselves with the necessaries or the unnecessaries of life. But if those who pulled the strings of co-operation tried to convince the people that they were doing better under that system, that was the private trader's business. If they, who had worked at their businesses all their lives, could be beaten by amateurs they deserved to be beaten. Their association, although only 18 months old, had amply justified its existence, and had aroused more interest in the question of co-operation than had ever been known in Sheffield before. He urged the private traders to educate co-operators up to their true advantage. It had been shown that the difference between dealing with

private traders and with co-operative stores amounted to 3s. 6d. in the pound, which was as much as the members of co-operative societies could obtain in interest and dividend. The argument of the co-operators was that they received their dividends in a lump sum, and thus saved where they otherwise would not. But it should be pointed out that if only 6s. 8d. was spent, there was a saving of 1s. 2d. immediately, a sum sufficient to be invested in a savings bank. He advised private traders to watch very closely the people who supplied co-operative stores—not to prevent them, for he would have nothing to do with coercion, but to see that they did not supply the society on better terms than those which they gave to the private trader. He opposed the principle of waiving income tax on co-operative societies' profits.

McLENDON HARDWARE COMPANY'S NEW BUILDING.

McLENDON HARDWARE COMPANY, Waco, Texas, has just completed the removal of its stock to a new building, the beautiful exterior of which is a special feature. The building is 150 feet square and three stories in hight. The first floor has an 18-foot ceiling, the second and third floors being 13 feet. The building fronts on two of the principal streets, a third side opening on a wide alley. All the windows are of prism glass. The building is of Thurber brick with terra cotta trimmings. It was constructed with a special view to carrying capacity and is one of the most substantial and elegant structures in the State.

LISK MFG. COMPANY'S CATALOGUE.

THE LISK MFG. COMPANY, Canandaigua, N. Y., has just issued an attractively printed catalogue containing nearly 450 pages showing the company's complete line, including patent Anti-Rusting Tinware, hand made Pieced Tinware, extra heavy retinned Stamped Ware, heavy Aluminum Galvanized Ware; nickel plated Copper Ware, four-coated Enameled Steel Ware and Imperial Gray Enameled Steel Ware. In the line of Anti-Rusting Tinware a number of new specialties are shown. This company sells exclusively to the retail trade and gives special attention to the attractive putting up of its products, with a view to facilitating their sale by retail merchants.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, etc., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column

ROSSMAN MFG. COMPANY, Rossman, Columbia County, N. Y.: Catalogue of the Rossman Ornamental Lawn and Farm Fence. The company also makes Tree Guards, Hitching Posts and Steel Flexible Rolling Mats, the latter being a new line.

THE HAWKEYE PUMP COMPANY, Washington, Iowa: Circular price-list of the Hawkeye Cistern, House and Stock Pumps.

THE GRIFFIN MFG. COMPANY, Erie, Pa.: A striking hanger for the Hardware merchant, calling attention to the company's Fleur-de-Lis Hinges.

L. D. PARKHURST, Danielson, Conn.: Price-list No. 3 devoted to Shoe Knives, referred to as manufactured from a special high grade crucible cast steel.

BROWN-WALES COMPANY, Boston, Mass.: Postal circular directing attention to the company's complete stock of Shelby Seamless Steel Tubing, including over 350 sizes.

THE BRISTOL COMPANY, Waterbury, Conn.: Catalogue No. 26, illustrating and describing a line of Recording Thermometers, the different classes of which, covering all ranges to 1200 degrees F., have been arranged with special reference to making it convenient for a prospective buyer of these instruments easily to select the one which would be the best adapted to meet special conditions.

RAHNS MFG. COMPANY, 2736 Oxford street, Philadelphia, Pa.: Circulars illustrating Safety Dog and Adjustable Leather Dog Muzzles.

FOLLANSBEE BROTHERS COMPANY, Pittsburgh, Pa.: Circulars relating to Charcoal Bright Tin, Roofing Tin, Sheet Steel, Sheet Copper, Galvanized and Black Sheets, Roofing Iron; Refined, Polished, Blued and Planished Steel, &c.

PEARSON JACK COMPANY, 64 Federal street, Boston, Mass.: Catalogue devoted to Car Replacing Jack, King Bolt Clamp, Ratchet Pulling Jack, Ratchet Pulling and Pushing Jack, Ratchet Journal Jack, Brake Beam Clamp and Car Pusher.

AMERICAN NICKELOID MFG. COMPANY, Peru, Ill.: Price-list of Nickeloid, Copperoid and Brassoid polished one side and two sides, Sheet Zinc, extra quality for stamping, and Yellow Bronze Belt Lacing.

THE SELLE GEAR COMPANY, Akron, Ohio: Catalogue devoted to Spring Wagon Gears and Wagon Specialties.

CENTRAL MFG COMPANY, 198-200 State street, Binghamton, N. Y.: Illustrated catalogue of the Stewart Gas and Iron Heated Pressing Irons and the I. M. E. Domestic and Laundry Sad Iron.

BRAKE-GIVENS IMPROVED TOOL HANDLE COMPANY, Paducah, Ky.: Printed matter illustrating Hammer and Hatchet Handles with a rubber sleeve fitted over the handle in such a manner as to afford a firm grip for the user.

A. WYCKOFF & SON COMPANY, Elmira, N. Y.: Catalogues relating to Wood Water Pipe, Chain Pump Tubing, Rubber Buckets, Pump Curbs, Steam Pipe Covering, &c.

THE HILBERT MACHINE COMPANY, 2116-2122 Colerain avenue, Cincinnati, Ohio: Illustrated catalogue of Modern Ice Cream Machinery, including Power and Hand Ice Cream Freezers and Ice Breakers; also a line of Ice Cream Manufacturers' Supplies.

ELWOOD LAWN MOWER COMPANY, Elwood, Ind.: Circular devoted to Improved High Grass, New Ball Bearing, Summit and Standard Lawn Mowers.

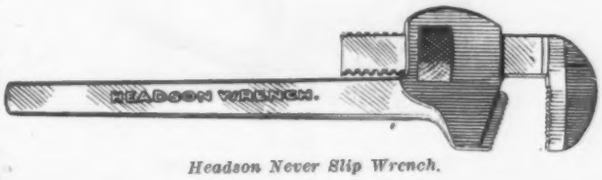
MISCELLANEOUS NOTE.

Keuffel & Esser Company.

Keuffel & Esser Company, 127 Fulton street, New York, has added 130 new numbers of cotton line measuring tapes in ass skin, duck, bent leather and sewed leather cases, and 18 new numbers of low priced pocket tapes, all of which are described in their trade price-list of measuring tapes. The company also manufactures steel metallic and linen tapes.

Headson Never Slip Wrench.

The jaws of the wrench shown in the accompanying cut are made of the best drop forged tool steel, tempered and drawn in oil to impart superior strength to the tool. It is pointed out that no matter how small or large the pipe may be for which the wrench is adjusted the angles of the jaws remain the same. The wrench has few



Headson Never Slip Wrench.

parts, the frame is rigid, the handle and yoke are combined in one part and the inserted jaw is movable. When the wrench is placed on pipe the pressure exerted on the

handle causes the inserted jaw to move forward and automatically clamp the pipe. The wrench is made in eight sizes, to take pipe from ⅛ inch to 5 inches. It is offered by Headson Tool Mfg. Company, Lafayette, Ind.

The Anchor Flower Bed Guard.

The flower bed guard and lawn border shown in the accompanying illustrations is designed to afford an ornamental and at the same time protecting border to lawns and flower beds. The wickets are of No. 8 gal-

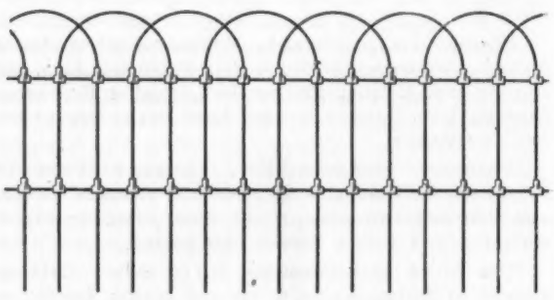


Fig. 1.—The Anchor Flower Bed Guard.

vanized steel wire and are held in alignment by two strands of No. 9 galvanized wire, to which they are rigidly attached by neat metal clamps which are brightly and smoothly dip galvanized, thus making the guard entirely weather proof as well as strong and attractive. It is shipped in compact rolls of 75 or 150 feet, either 16 inches or 22 inches high, and may be cut into lengths

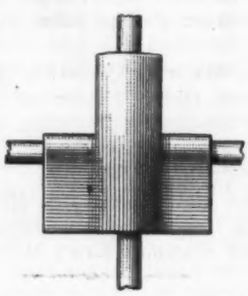
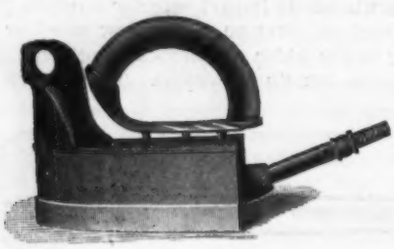


Fig. 2.—Metal Clamp.

to suit the customer. It may be bent without difficulty to conform to the shape of any flower bed or lawn edge, and small S hooks are provided for joining the ends together around a bed or shrub. The guard is manufactured by the New England Anchor Fence Company, connected with the Spencer Wire Company, Worcester, Mass.

The I. M. E. Gas Heated Sad Iron.

Central Mfg. Company, 196 State street, Binghamton, N. Y., is putting on the market the gas heated sad iron

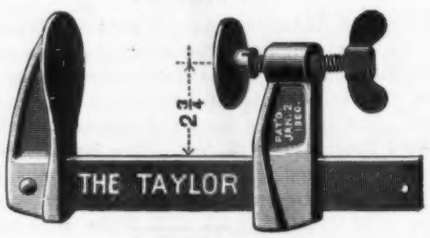


The I. M. E. Gas Heated Sad Iron.

shown in the accompanying cut, for domestic or steam laundry use, natural or artificial gas. The burner is of an improved Bunsen type, using several times as much air as gas to make the expense of heating merely nominal. It is explained that the use of the iron is unaccompanied by escaping flame, smoke, soot or smell and that as the flame is entirely inclosed the bottom of the iron is always clean and ready for use. The weight of the iron is about 6 pounds and its length 6½ inches. The handle is of semicircular pattern, and being protected from the body of the iron by an air space does not become hot. The iron, it is remarked, will heat quickly and evenly and can be made hot enough for ironing a wet tablecloth or cooler for use on a cambric handkerchief.

The Taylor Self Locking Clamp.

The quick adjusting, self locking steel bar cabinet and pattern makers' clamp shown herewith is offered by the James L. Taylor Mfg. Company, Bloomfield, N. J. The clamping faces are 2½ inches in diameter, steel bar



The Taylor Self Locking Clamp.

1½ x ¼ inch, steel screw ⅝ inch, with pivoted steel button. From the bar to the center of the screw the distance is 2¾ inches. The castings are of steel. A clamp of this style has been tested, the manufacturer remarks, to a safe clamping strain of 2400 pounds. The clamps are made in stock sizes from 5 inches to 4 feet opening, and in special sizes up to 14 feet. They have been designed to meet the demand for a clamp of medium weight with large clamping surfaces.

Solid Frame Double Action Revolvers.

Harrington & Richardson Arms Company, Worcester, Mass., has lately put on the market solid frame double action revolvers, models 1904 and 1905, the latter model being shown herewith. The 1905 model is a small frame revolver following the lines of the company's Premier revolver, .32 caliber, and eventually will probably succeed

1905 *Model Solid Frame Double Action Revolver.*

the Young America revolver in .32 caliber only. This model with 2½-inch barrel weighs 11 ounces and handles the .32 S. & W. cartridge. The 1904 model follows closely the lines of the company's Automatic, and is intended to succeed the American double action in .32 and .38 calibers, which has been made for more than 20 years. This revolver in .32 caliber is six-shot and with 2½-inch barrel weighs 16 ounces. In addition to the .32 S. & W. it will handle the .32 S. & W. long and .32 Colt new police cartridges. In .38 caliber this model is five-shot, and with 2½-inch barrel weighs 15 ounces, handling only the .38 S. & W. cartridge. Both of the above models can be furnished with 4½ and 6 inch octagon barrels in either nickel or blue finish.

The Jeffords Floor Clamp.

The Jeffords Mfg. Company, Kansas City, Mo., is placing on the market the floor clamp shown in the accompanying cuts. Fig. 1 shows the device ready for work, while Fig. 2 shows the various parts separated. The claim is made that the clamp will work equally well on any size floor timber or on a double floor. The

Fig. 1.—The Jeffords Floor Clamp.

arrangement of its parts is such that it leaves no mark on the flooring, because the flat tooth catches in the top of the floor timber, so that the small puncture is always covered by the flooring. Owing to the equalizing joint at the back of the jaw the pressure is always uniform on both parts of the grooved jaw, which also takes the side strain off the plunger, to make it impossible to break it. The lever is 24 inches long and the jaw 5 inches wide, so that the clamp always stands upright on the floor ready for use and avoids the necessity of stooping over to pick it up. The front part of the clamp being heavier than the back causes it to drop into position ready for the next operation. The half round tooth in the rear end stands at an angle of 77 degrees, and in using the clamp the operator simply places his left foot on the pad above the tooth and as the pressure is put on the lever the tooth seats itself in the floor timber. The dog on the back of the lever automatically holds the board in place while it is being nailed. The leverage is said to be amply sufficient to enable the operator to bring to bear a pressure of 1500 pounds on the edge of the flooring. The clamp can be taken apart without the aid of a screw driver or wrench, and can be quickly put together again. When taken apart it can be packed in a space 1½ x 6 x 24 inches. The claim is made that by the use of the attachment the last boards can be laid nearly as quickly as the others, even though the last board is within ¼ inch of the wall. The only change necessary in order to use the adjustment is to screw the headless bolt shown in Fig. 1 down through the hollow bolt in the back of the jaw sufficiently to engage with the holes in the top of the attachment. The lower end of the bolt is cone shaped, to keep it from slipping out of the holes in the attach-

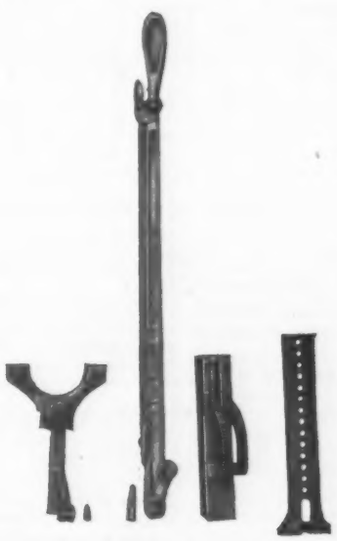


Fig. 2.—Various Parts of the Jeffords Floor Clamp.

ment when pressure is put upon it. The clamp is made entirely of cast steel, nickel plated, and the total weight is but 8½ pounds, thus rendering it convenient to operate with one hand.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

	℔ lb
Lead, English white, in Oil	9¼@ 9¼
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 6¼
Lots less than 500 lb	@ 7
In Barrels	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price	@ 1½
Lead, American. Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	
	℔ lb
Lead, White, Dry in bbls	@ 6
Zinc, American, dry	**4¾@ 4¾**
Zinc, French:	
Paris, Red Seal, dry	8¼
Paris, Green Seal, dry	9½
Antwerp, Red Seal, dry	7¾
Antwerp, Green Seal, dry	8¾
Zinc, V. M. French, in Poppy Oil: Green Seal:	
Lots of 1 ton and over	11¾@12¼
Lots of less than 1 ton	11¾@12¾
Zinc, V. M. French, in Poppy Oil: Red Seal:	
Lots of 1 ton and over	10¾@10¾
Lots of less than 1 ton	10¾@11¼

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades, 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	℔ lb
Black, Carbon	5 @10
Black, Drop, Amer	4 @ 6
Black, Drop, Eug	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	½@ 1
Carmine, No. 40	$3.50@3.60
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
Litharge, American, bbls	6 @ 6½
Ocher, American	℔ ton $8.50@16.00
Orcher, American Golden	2½@ 3½
Orcher, French	1½@ 2½
Orcher, Foreign Golden	3 @ 4
Orange Mineral, English	9 @10
Orange Mineral, French	10½@11¼
Orange Mineral, German	7¾@10
Orange Mineral, American	8 @ 8¾
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	℔ 100 lb $0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital., Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Talc, French	℔ ton $20.00@30.00
Talc, American	℔ ton 16.00@25.00
Terra Alba, French	℔ 100 lb 90 @1.00
Terra Alba, English	℔ 100 lb 90 @1.00
Terra Alba, American, ℔ 100 lb., No. 1	.00 @70
Terra Alba, American, ℔ 100 lb., No. 2	.45 @50
Umber, T'key, Bnt. & Pow	2½@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1½@ 2
Umber, Raw, Amer	1½@ 2
Yellow, Chrome	11 @14
Vermilion, American Lead	10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@66
Vermilion, English, Import	75 @80
Vermilion, Chinese	$0.90@1.00

Colors in Oil—

	℔ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	10 @15
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber Burnt	11 @14

Miscellaneous—

Barytes, White, Foreign	℔ ton $17.50@19.00
Barytes, Amer. floated	℔ ton 17.00@19.00
Barytes, Crude, No. 1	℔ ton 10.00@11.00
Chalk, in bulk	℔ ton 3.00@ 3.25
Chalk, in bbls	℔ 100 lb @ .35
China Clay, English	℔ ton 11.00@17.00
Cobalt, Oxide	℔ 100 lb 2.50@ 2.60
Whiting, Common	℔ 100 lb .43@ .48
Whiting, Gilders	℔ 100 lb .50@ .55
Whiting, Ex. Gilders	℔ 100 lb .55@ .60

Putty, Commercial—℔ 100 lb

In bladders	$1.70@..
In bbls. or tubes	1.05@1.10
In 1 lb to 5 lb cans	2.00@2.90
In 12½ to 50 lb cans	1.40@1.55

Spirits Turpentine—℔ gal.

In Oil bbls	68½@69
In machine bbls	69 @69½

Glue—

	℔ lb
Cabinet	11 @15
Common Bone	7 @ 9
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	8 @11
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	9 @12
Medium White	14 @17

Gum Shellac—

	℔ lb
Bleached Commercial	30 @31
Bone Dried	40 @41
Button	36 @45
Diamond I	50 @52
Fine Orange	40 @45
A. C. Garnet	33 @35
D. C	65 @..
Octagon B	@45
T. N	30 @31
V. S. O	@45

Animal, Fish and Vegetable Oils—℔ gal.

Linseed, City, raw	50 @51
Linseed, City, boiled	52 @53
Linseed, State and West'n. raw	48 @49
Linseed, raw Calcutta seed	@60
Lard, Prime, Winter	58 @60
Lard, Extra No. 1	47 @48
Lard, No. 1	35 @39
Cotton-seed, Crude, f.o.b. mills	21 @21½
Cotton-seed, Summer Yellow, Prime	27½@27¾
Cotton-seed, Summer Yellow, off grades	@..
Sperm, Crude	60 @..
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	60 @63
Sperm, Bleached Winter	63 @65
Tallow, Prime	51 @53
Whale, Crude	@..
Whale, Natural Winter	42 @44
Whale, Bleached Winter	44 @46
Menhaden, Brown, Strained	28 @29
Menhaden, Light, Strained	29 @30
Menhaden, Bleached, Winter	31 @32
Menhaden, Ex-Bld. Winter	32 @33
Menhaden, Southern	17 @18
Cocoanut, Ceylon	℔ lb 6¾@ 6¾
Cocoanut, Cochin	℔ lb 7¼@ 7½
Cod, Domestic, Prime	35 @37
Cod, Newfoundland	40 @42
Red Elaine	31 @32
Red, Saponified	℔ lb 4¾@ 5
Olive, Italian, bbls	54 @58
Neatsfoot, prime	49 @50
Palm, Logos	℔ lb 5¼@ 5¾

Mineral Oils—

Black, 29 gravity, 25@30 cold test	℔ gal. 10½@11¼
Black, 29 gravity, 15 cold test	11½@12½
Black, Summer	10½@11½
Cylinder, light filtered	18 @19
Cylinder, dark filtered	16 @17
Paraffine, 903-907 gravity	12½@13
Paraffine, 903 gravity	11¼@12
Paraffine, 883 gravity	9¼@ 9½
Paraffine, Red	11½@13

In small lots ¼¢ advance.

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Domestic, ℔ doz. $3.00.....33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent.....35%
Taplin's Perfection.....35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils.....℔ lb 7¼@7¾¢
Hay-Budden, Wrought.....9@9¼¢
Horseshoe brand, Wrought.....9@9¼¢
Trenton .....℔ lb 9@9¼¢

Imported—
Peter Wright & Sons.....℔ lb 10¼¢

Anvil, Vise and Drill—
Millers Falls Co., $18.00.....15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Livingston Nail Co.....33⅓%

Augers and Bits—
Com. Double Spur.....70&10%
Boring Mach. Augers.....70&10%
Car Bits, 12-in. twist.....50&10%
Jennings' Patn. reg. finish.50&10%
Ford's Auger and Car Bits.....40&5%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list..25%
No. 30, R. Jennings' list.....40&7½%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits.....15%
Mayhew's Countersink Bits.....45%
Millers Falls.....50&5&2½%
Ohio Tool Co.'s Bailey Auger and Car Bits.....40&10%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....60%
Snell's Car Bits, 12-in. twist....60&10%
Wright's Jennings' Bits.....50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's small, $18; large, $26....50&10%
Clark's Pattern, No. 1, ℔ doz. $26; No. 2, $18.....50&10@60%
Ford's, Clark's Pattern.....50&10@60%
C. E. Jennings & Co., Steer's Pat..25%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dble. Cut....*$3.00@3.85*
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz..$9.00@10.00
Ames .....25&10%
New Patent.....25&10%
Universal 20%
Wood's Universal.....25%

Ship Augers and Bits—
Ford's .....33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' .....35&5%
Ohio Tool Co.'s.....40%
Snell's 40%

Awl Hafts— See *Hafts, Awl.*

Awls—
Brad Awls:
Handled .....*gro. $2.75@3.00*
Unhdled, Shldered...*gro.63@66¢*
Unhandled, Patent..*gro.66@70¢*
Peg Awls:
Unhandled, Patent..*gro. $1@3¼¢*
Unhdled, Shldered..*gro. 65@70¢*
Scratch Awls:
Handled, Com...*gro. $3.50@4.00*
Handled, Socket..*gro.$11.50@12.00*
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights. (up to 3¼ lb.)
First Quality.....*$6.50*
Second Quality.....*$6.00*
NOTE.—Heavier Weights add Extras as per regular schedule.

Axle Grease—
See *Grease, Axle*

Axles— *Iron or Steel*
Concord, Loose Collar...4¼@4¾¢
Concord, Solid Collar...4¾@5¼¢
No. 1 Common, Loose...3¼@3¾¢
*No. 1½ Com., New Style*3¾@4¼¢
No. 2 Solid Collar.....4@4½¢
Nos. 7, 8, 11 and 12....75@75&5%
Nos. 13 to 14.....70&10@75&5%
Nos. 15 to 18.....75&10@75&10&5%
Nos. 19 to 22.....75&10@75&10&5%

Boxes, Axle—
Common and Concord, not turned lb.,4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent.....*lb. 8½@9¢*

Bait— Fishing—
Hendryx:
A Bait.....20%
B Bait.....25%
Competitor Bait.....20&5%

Balances— Sash—
Caldwell new list.....50%
Pullman .....50&10@60%

Spring—
Spring Balances.....60@60&5%
Chatillon's:
Light Spg. Balances.....40&10%
Straight Balances.....40%
Circular Balances.....50%
Large Dial.....30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—
Steel Crowbars, 10 to 40 lb.... per lb., 2¾@3¼¢

Towel
No. 10 Ideal, Nickel Plate..℔ gro. $8.50

Beams, Scale—
Scale Beams.....*40&10@50%*
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric.....℔ gro. $7.80
No. 2 Buffalo.....℔ gro. $9.00
No. 3 Perfection Dust.....℔ gro. $8.00

Egg—
Holt-Lyon Co.:
Holt, No. A, Japanned....℔ doz. $1.20
Holt, No. 1, Tinned.....℔ doz. $1.50
Holt, No. B, Japanned....℔ doz. $2.00
Holt, No. 2, Tinned.....℔ doz. $2.25
Lyon, No. 2, Japanned....℔ doz. $1.25
Lyon, No. 3, Japanned....℔ doz. $1.50
Taplin Mfg. Co.: ℔ gro.
No. 00 Improved Dover.....$6.00
No. 75 Improved Dover.....$6.50
No. 100 Improved Dover.....$7.00
No. 102 Improved Dover, Tin'd..$8.50
No. 150 Improved Dover, Hotel..$15.00
No. 152 Imp'd Dover, Hotel, T'd.$17.00
No. 200 Imp'd Dover Tumbler....$8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo.....$7.00
Wonder (S. S. & Co.).℔ gro. net, $6.00

Bellows—
Blacksmith, Standard List.. *60&10@70&10%*

Blacksmiths'— *Net Prices.*
Inch..	*30*	*32*	*34*	*36*	*38*	*40*
Each.	*$3.25*	*3.50*	*4.00*	*4.50*	*5.00*	*5.75*

Extra Length:

Each.	*$3.75*	*4.25*	*4.75*	*5.25*	*6.00*	*7.00*

Hand—
Inch...	*6*	*7*	*8*	*9*	*10*
Doz...	*$4.50*	*5.00*	*5.50*	*6.00*	*6.50*

Molders—
Inch.	*9*	*10*	*11*	*12*	*14*
Doz.	*$8.00*	*9.00*	*10.50*	*12.50*	*14.50*

Bells— Cow—
Ordinary goods...75&5@75&10&5%
High grade.....70&10@70&10&5%
Jersey .....75&10%
Texas Star.....50%

Door—
Abbe's Gong.....45%
Burton Gong.....50%
Home, R. & E. Mfg. Co.'s.....55&10%
Lever and Pull, Sargent's....60&10&10%
Trip Gong.....50&10@50&10&5%
Yankee Gong.....55%

Hand—
Hand Bells, Polished, Brass.. 60&5@60&10&5%
White Metal.....60%
Nickel Plated....50&10@50&10&5%
Swiss .....60@60&7½%
Cone's Globe Hand Bells.....33⅓@35%
Silver Chime.....33⅓@35%

Miscellaneous—
Farm Bells.....*lb. 2¼¢*
Steel Alloy Church and School *50&10&5@60&5%*
American Tube & Stamping Co. Gongs 75%
Table Call Bells.....50@50&10%

Belting— Leather—
Extra Hvy, Short Lap.60@60&5%
Regular Short Lap...65&10@70%
Standard .....70&5@70&10%
Light Standard.....70&10@75%
Cut Leather Lacing.....60&10%
Leather Lacing Sides, per sq. ft. *17½@18¢*

Rubber—
Agricultural (Low Grade).... 75@75&5%
Common Standard....70@70&10%
Standard .....65&70%
Extra .....60&5@60&10%
High Grade.....50&5@50&10%

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender.....40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—
John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—
Common Wooden....70&10@75&5%
Harts St. Tackle Blocks.....50@50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves.....50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron....50&10%
Stowell's Self Loading.....60%
See also Machines, Hoisting.

Boards, Stove—
Zinc, Crystal, &c...30&10@40&10%

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co.....33⅓%

Bolts—

Carriage, Machine, &c.—
Common Carriage (cut thread): ⅝ x 6 and Smaller.....75% *Larger and longer*..65&10&2½%
Phila. Eagle,$3.00 list May 2½,'99 80%
Bolt Ends, list Feb. 14, '95..70&2½%
Machine, ⅝ x 4 and smaller 75&2½%
Machine, larger and longer.. 70&5%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz.	*$0.30*	*.35*	*.45*	*.56*	*.75*

Cast Iron Spring Foot, Jap'd:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.15*	*1.40*	*2.00*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.95*	*1.25*	*1.55*

Cast Iron Shutter, Japanned, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.80*	*.90*	*1.20*

Wrt Barrel Japd.....80@80&10%
Wrt " Bronzed....50@50&10%
Wrt. Spring...70&10@70&10&10%
Wrt. Shutter.....50&5@50&10&5%
Wrt. Square Neck.....75@75&10%
Wrt Square.66⅔&10@66⅔&10&10%
Ives' Patent Door.....60%

Stove and Plow—
Plow .....65&10@65&10&10%
Stove .....82½&10@82½&10&5%

Tire—
Common 80%
Norway Iron.....80%
American Screw Company:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Bay State, list Dec. 28, '99.....80%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80%
Eagle Phila., list Oct. 16, '84....82½%
Eclipse, list Dec. 28, '99.....80%
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99.....80%
Norway Phila., list Oct., '84.....80%
Upson Nut Co.:
Tire Bolts.....72½%

Borers, Tap—
Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz...	*$4.80*	*5.60*	*6.40*	*8.00*
Inch			*2¼*	*2½*
Per doz.....			*$5.65*	*11.50*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25%

Boxes, Mitre—
C. E. Jennings & Co.....30%
Langdon .....15&10%
Perfection .....℔ doz. $30.00
Schatz 40%
Stanley R. & L. Co.:
Nos. 240 to 460.....30%
Nos. 50 and 60.....35%

Braces—
Common Ball, American..$1.25@1.30
Barber's .....50&10&10@60&10%
Fray's Genuine Spofford's.....60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 .....60%
C. E. Jennings & Co.....50&5%
Mayhew's Ratchet.....60%
Mayhew's Quick Action Hay Pat...50%
Millers Falls Drill Braces.....25&10%
P., S. & W. Co., Peck's Pat.60&10@65%
Stanley R. & L. Co.:
Stanley 35%
Victor 45%

Brackets—
Wrought Steel...80&10@80&10&5%
Bradley's Wire Shelf:
Full cases.....80&10&10%
Broken cases.....80&10&10%
Griffin's Pressed Steel.....80@80&10%
Griffin's Folding Brackets.....70&10%
Stowell's Cast Shelf.....75%
Stowell's Sink.....50%
Western, W. G. Co., Wire.....60&10%

Bright Wire Goods—
See *Wire and Wire Goods.*

Broilers—
Kilbourne Mfg. Co.....75&20%
Western, W. G. Co.....80%
Wire Goods Co.....70@75&10%

Buckets, Galvanized—
Price per dozen.

Quart.....	*10*	*12*	*14*
Water, Regular...	*1.40*	*1.70*	*1.90*
Water, Heavy....	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom..	*2.30*	*2.55*	*2.95*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—
Hoosier.....℔ gro. $36.00

Bull Rings—See *Rings, Bull*

Butts— Brass—
Wrought, list Sept., '96.....*30%*
Cast Brass, Tiebout's.....50%

Cast Iron—
Fast Joint, Broad....40&10@50%
Fast Joint, Narrow...40&10@50%
Loose Joint.....70&10@75%
Loose Pin.....70&10@75%
Mayer's Hinges.....70@70&5
Parliament Butts.....70@70&5

Wrought Steel— *Net Prices.*
Table and Back Flaps...75%
Narrow and Broad.....75%
Inside Blind.....75%
Loose Pin.....75%
Loose Pin, Jap'd.....70&10%
Loose Pin, Ball and Steeple Tip 85%
Japanned Ball Tip Butts... 70&10%
Bronzed, Wrt., Nar. and Inside Blind Butts....55&10%

Cages, Bird—
Hendryx Brass:
3000, 5000, 1100 series.....5%
1200 series.....33⅓%
200, 300, 600 and 900 series.....40&10%

Extra, list 10@20%

Hendryx Bronze:
700, 800 series....40&10%
Hendryx Enameled....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

Blunt, 1 prong.....per lb.4¢@4¼¢
Sharp, 1 prong...per lb., 4½@4¾¢
Gautier, Blunt....4¢@4¼¢
Gautier, Sharp....4½@4¾¢
Perkins', Blunt Toe....₱ lb 3.65¢
Perkins', Sharp Toe....₱ lb 4.15¢

Can Openers—
See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern	$1.35	1.85	2.05 each.
New York Pattern	1.50	2.20	2.45 each.
Baltimore Pattern	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....53@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket.....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball....$1.40
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed.....70@70&10%
Plate.....60&10@60&10&5%
Philadelphia.....75@75&10%
Acme, Ball Bearing....33⅓%
Boss....70&10%
Boss Anti-Friction....70&10%
Gem (Roller Bearing)....80%
Martin's Patent (Phoenix)....45%
Standard Ball Bearing....45%
Tucker's Patent low list....30%
Yale (Double Wheel) low list....50%

Cattle Leaders—
See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
$7.50	5.35	4.40	3.70	3.55	3.45	3.40

⅝ ¾ ⅞ 1 to 1¼ inch.
$3.35 3.30 3.25 3.25 per 100 lb.
German Coil.....60&10&10@70%

Halters and Ties—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Cow Ties.....60@60&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring..$23.50
6½—6-2, Str'ght, with ring..$24.50
6½—8-2, Str'ght, with ring..$28.00
6½—10-2, Str'ght, with ring.$32.00
NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.
Trace, Wagon and Fancy Chains.....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron.....60&10@60&10&5%
Brass.....60&10@60&10&10%
Safety Chain.....75@75&10&5%
Gal. Pump Chain....lb. 5@5¼%
Covert Mfg. Co.:
Breast....35&5%
Halter....35&5%
Heel....35&5%
Rein....35&5%
Stallion....35&5%
Covert Sad. Works:
Breast....70%
Halter....70%
Hold Back....70%
Rein....70%
Oneida Community:
Am. Coil and Halters....40@40&5%
Am. Cow Ties....45@50
Eureka Coil and Halter....45@50&5%
Niagara Coil and Halter....45@50&5%
Niagara Cow Ties....45&5@50&10&5%
Niagara Wire Dog Chains..45@50&5%
Wire Goods Co.:
Dog Chain....70&10%
Universal Dbl.-Jointed Chain....50%

Chalk—(From Jobbers.)

Carpenters' Blue....gro. 35@38¢
Carpenters' Red....gro. 30@33¢
Carpenters' White....gro. 25@28¢
See also Crayons.

Checks, Door—

Bardsley's....45%
Columbia....50&10%
Eclipse....60&10%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools....55%
Youths' Chests, with Tools....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools....20%
Machinists' and Pipe Fitters' Chests, Empty....50%
Tool Cabinets....50%
C. E. Jennings & Co.'s Machinists' Tool Chests....33⅓&10%

Chisels—

Socket Framing and Firmer

Standard List.....75@75&10%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Socket Firmer No. 10....60%
Ohio Tool Co.'s....70%
Swan's....70%
L. & I. J. White....30@30&5%

Tanged—

Tanged Firmers..33 1-3@33 1-3&10%
Buck Bros....30%
Charles Buck....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White, Tanged....25&5%

Cold—lb.

Cold Chisels, good quality..13@15¢
Cold Chisels, fair quality..11@12¢
Cold Chisels, ordinary...9@10¢

Chucks—

Beach Pat., each $8.00....35&5%
Empire....25%
Blacksmiths'....25%
Jacobs' Drill Chucks....35%
Pratt's Positive Drive....25%
Skinner Patent Chucks:
Independent Lathe Chucks....50%
Universal....50%
Combination....50%
Drill Chucks, New Model....30%
Drill Chucks, Standard....45%
Drill Chuck, Skinner Pat., 0, 1, 2..35%
Drill Chucks, Skinner Pat., 3, 4, 5, 6, 7, 8....35%
Drill Chucks, Positive Drive....30%
Planer Chucks....25%
Face Plate Jaws....40%
Standard Tool Co.:
Improved Drill Chuck....45%
Union Mfg. Co.:
Combination....50%
Czar Drill....35%
Combination Geared Scroll....40%
Geared Scroll....40%
Independent....50%
Independent Steel....40%
Union Drill....45%
Universal....50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks....50%
Little Giant Auxiliary Drill....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved....50%
Oneida Drill....50%
Scroll Combination Lathe....50%

Clamps—

Adjustable, Hammers'....20@20&5%
Cabinet, Sargent's....50&10%
Carriage Makers', P. S. & W. Co..50%
Carriage Makers', Sargent's....60%
Bealy, Parallel....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co....40%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable....55%
Iwan's Champion, Stationary....45%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros....30%
New Haven Edge Tool Co.'s....45%
Fayette R. Plumb....33⅓@33⅓&10%
L. & I. J. White....30%

Clippers—

Chicago Flexible Shaft Company:
'98 Chicago Horse....$8.75 } 15%
1902 Chicago Horse....$10.75 }
20th Century Horse, each, $5.00....20%
Lightning Belt....$15.00 }
Chicago Belt....$20.00 } 15%
Stewart's Patent Sheep, $12.75....20%

Finger Nail Clippers—

Smith & Hemenway Co.₱ doz. net $2.00

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in..60&10@70%

Cloth and Netting, Wire
—See *Wire, &c.*

Cocks, Brass—

Hardware list:
Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....70&10@75%

Coffee Mills—
See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list....40%
Leather, Walter B. Stevens & Son's list....40%

Combs, Curry—

Metal Stamping Co....40%

Mane and Tail—

Covert's Saddlery Works....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers....65%
Calipers, Double....65%
Calipers, Inside or Outside....65%
Calipers, Wing....60%
Compasses....50%

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
A Eastern.....	*75&5%*	*75%*
B, Eastern.....	*75&10%*	*75&5%*
Central.....	*75&5%*	*70&10&5%*
Southern.....	*70&7½%*	*70&8½%*
S. Western.....	*70&5%*	*70%*

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal, each..	2	3	4	6	8
Labrador...	$1.20	$1.50	$1.80	$2.10	$2.70
Gal..	3	4	6	8	
Iceland, ea..	$1.80	$2.10	$2.40	$3.00	
Gal..	2	3	4	6	8
Galv. Lined, ea.	$1.85	$2.00	$2.25	$2.90	$3.90 25%

Gavl. Lined, side handles,

Gal.	2	3	4	6	8
Each.	$1.95	$2.15	$2.40	$3.30	$4.15..25%

Coopers' Tools—
See *Tools, Coopers'.*

Cord— Sash—

Braided, Drab.....lb. 35¢
Braided White, Com.lb..21@22½¢
Cable Laid Italian..... lb., A, 18¢; B, 16¢
Common India..... lb. *10@10½¢*
Cotton Sash Cord, Tw'ted..11@17¢
Patent Russia.....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted.lb. 12@13¢
Anniston Cordage Co.: Braided Cotton,
Old Glory, Nos. 7 to 12....₱ lb 28 ¢
Anniston, Nos. 7 to 12....₱ lb 22 ¢
Old Colony, Nos. 7 to 12..₱ lb 22 ¢
Anniston Drab, Nos. 7 to 12.₱ lb 26 ¢
Pearl Braided, cotton, No. 6, ₱ lb, 22½¢; No. 7, 21½¢; Nos. 8 to 12, 21¢
Eddystone Braided, Nos. 7, 8, 9 and 10....₱ lb 24 ¢
Eddystone Braided Cotton, No. 6..₱ lb 25 ¢
Harmony Cable Laid Italian, Nos. 7 to 10....₱ lb 23 ¢
Peerless:
Cable Laid Italian....16 ¢
Cable Laid Russian....14 ¢
Cable Laid India....12 ¢
Braided India....18 ¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton....₱ lb 40 ¢
Braided, Italian Hamp....₱ lb 40 ¢
Braided, Linen....₱ lb 55 ¢
Braided, White Cotton or Spot....₱ lb 35 ¢
Massachusetts, White....₱ lb 28 ¢
Massachusetts, Drab....₱ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab....40 ¢
A quality, White....35 ¢
B quality, Drab....35 ¢
B quality, White....30 ¢
Italian Hemp....40 ¢
Linen....67½¢

Wire, Picture—

List Oct., '00.....
85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain.....40&12½%

Crayons—

White Round Crayons, gr. 5½@6¢
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.:
Jumbo Crayons....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square....gr. $1.50
Rolling Mill Crayons....gr. $2.50
Railroad Crayons (composition)....gr. $2.00
Case lots, 20%
Zelnicker's Lumber:
Red, Blue, Green....₱ gro. $6.50
Black....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy....₱ doz. $7.00
Fort Madison, Light....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor....₱ doz. $3.00
Wm. Rogers & Son....₱ doz. $2.50

Cutters— Glass—

H. H. Mayhew Co....40%
Red Devil....50%
Smith & Hemenway Co....50%
Woodward....40%

Meat and Food—

American....30%

Nos.	1	2	3	4	B	5
Each.	$5	$7	$10	$25	$30	$60

Enterprise....25@25&7½%

Nos.	5	10	12	22	32
Each.	$2	$3	$2.75	$4.50	$6

Dixon's....₱ doz. 30&10@40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal....40&10@50%
Little Giant....₱ doz. 33⅓@40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers....40%
New Triumph No. 605, ₱ doz. $24.00.. 30&10@40%
Russwin Food, No. 1, $24.00; No. 2, $27.00....45&10&10%
Woodruff's....₱ doz. 30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c....40%
Kraut Cutters, 24 x 7, 28 x 8, 30 x 9....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$36

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise....25@30%
National, ₱ doz., No. 1, $21; No. 2, $18....40%
Sargent's, ₱ doz., No. 2....60%
Sargent's, Nos. 12 and 21....60&10%

Washer—

Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'red Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers....₱ doz. $6.25
Iwan's Perfection Post Hole Digger.. ₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers....₱ doz. $7.25
Kohler's Universal....₱ doz. $15.00
Kohler's Little Giant....₱ doz. $12.00
Kohler's Hercules....₱ doz. $10.00
Kohler's Invincible....₱ doz. $9.00
Kohler's Rival....₱ doz. $8.00
Kohler's Pioneer....₱ doz. $7.20
Never-Break Post Hole Diggers, ₱ doz., $24.00....60
Samson, ₱ doz. $34.00....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ⅞ in....₱ doz. $10.00
Phillips', style 077, ⅞ in....₱ doz. $7.50
Phillips', style x-y, ⅞ in....₱ doz. $10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each.....$1.50@$1.75
Breast, Millers Falls....15&10%
Breast, P. S. & W....40&5%
Goodell Automatic Drills..40&5&10&10%
Johnson's Automatic Drills, Nos. 2 and 3....16⅔%
Johnson's Drill Points....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis....25%
Ratchet, Parker's....40%
Ratchet, Weston's....33⅓%
Ratchet, Whitney's, P. S. & W....50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00....33⅓%

Twist Drills—

Bit Stock.....60&10&10@70%
Taper and Straight Shank..... 60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ₱ doz., 2½ in., $6; 4-in., $7.50; 6-in., $9....40%
Buck Bros.' Screw Driver Bits....30%
Champion....50%
Edson....60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood....40%
Mayhew's Black Handle....40%
Mayhew's Monarch....40&10%
Millers Falls, Nos. 20 and 21....25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Never Turn....60%
New England Specialty Co....50%
Sargent & Co.'s:
Nos. 1 and 60....50&10&10%
Nos. 50 and 55....60&10%
Nos. 20 and 40....70&10%
Smith & Hemenway Co....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles....65%
No. 86....75%
Victor....55%
Defiance....70%
Swan's:
Nos. 65 to 68....50%
No. 40....40&10%
Nos. 25, 35 and 45....20&10&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
A, Eastern.....	*80&7½%*
B, Eastern.....	*80&12½%*
Central.....	*80&7½%*
Southern.....	*70&20&10%*
S. Western.....	*75&12½%*

Terms,—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments:
Galv. Steel and Galv. C. C. Iron or Tin.....60&10%
Copper.....37½%
Perfect Elbows (S., S. & Co.)....40%

Emery, Turkish—

	4 to 16	*5½ to 180*	*Flour*
Kegs.....lb.	*5 ¢*	*5½¢*	*3½¢*
½ Kegs.....lb.	*5½¢*	*5¾¢*	*3¾¢*
¼ Keys.....lb.	*5½¢*	*6 ¢*	*4 ¢*
10-lb. cans, 10 in case....	*6½¢*	*7 ¢*	*6 ¢*
10-lb. cans, less than 10.....	*10 ¢*	*10 ¢*	*8 ¢*
Less quantity..	*10 ¢*	*10 ¢*	*8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's....50&10%
Walling's....45%

Cord and Weight—

Ives....40%

Faucets—
Cork Lined.....50@50&10%
Metallic Key, Leather Lined..60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I. X. L. Cork Lined..50%
John Sommer's Reliable Cork Lined..50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's O. K. Cork Lined...50%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—
See *Plates, Felloe.*

Files— Domestic—
List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—
Stubs' Tapers, Stubs' list, July 2¼, '97.....33 1-3@40%

Fixtures. Fire Door—
Richards Mfg. Co.:
Universal, No. 103.....$4.00
Special, No. 104.....$4.00
Fusible Links.....$0.25
Expansion Bolts.....50&10%

Grindstone—
Net Prices:

Inch	15	17	19	21	24
Per doz.	$2.15	2.85	3.25	3.75	4.50

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....70%
Stowell's Giant Grindstone Hanger..℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10%
Stowell's Grindstone Fixtures, Light.....60&10%

Fodder Squeezers—
See *Compressors.*

Forks—
NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66⅔%
Victor, Header.....65%
Champion, Hay.....66⅔%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—
White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	1	2	3	4	6
Each	$1.30	$1.60	$1.90	$2.20	$2.80

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*
Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
} 10&2½%

Gates, Molasses and Oil—
Stebbins' Pattern.80&10@80&10&5%

Gauges—
Marking, Mortise, &c.....50&10&5@50&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....30%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....30&10%

Gimlets— Single Cut—
Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No 1, $2.30; 2, $2.60
Spike, Wood Handled, No 1, $4.30; 2, $4.60

Glass, American Window
See *Trade Report.*

Glasses, Level—
Chapin-Stephens Co.....60@60&10&10%

Glue. Liquid Fish—
Bottles or Cans, with Brush..25@50%
Cans (½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's)....40&10%

Grease, Axle—
Common Grade....gro. $4.50@5.50
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb, $1.20; 2 lb, $2.00

Grips, Nipple—
Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—
Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—
Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00 } 33⅓%
Pike Mower and Tool Grinder, each.....$6.00 }
Velox Ball Bearing, Mounted, Angle Iron Frames, each.....$3.25

Halters and Ties—
Covert Mfg. Co.:
Web.....35&5%
Jute Rope.....50%
Sisal Rope.....30&10%
Cotton Rope.....45%
Hemp Rope.....45%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties.....70%
Sisal Rope Ties.....60&10%
E. T. Rugg & Co.:
Leather Halters.....50%
Web Halters and Webbing.....60%
Jute and Sisal Rope Halters.....60%
Jute and Sisal Horse and Cattle Ties.....60%
Cotton Horse Ties.....60%
Livery Ties, Braided.....60%

Hammers—
Handled Hammers—
Heller's Machinists'..40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox.....40&10&5%
Fayette R. Plumb:
Plumb. A. E. Nail.....33⅓&7½@33⅓&10&7½%
Engineers' and R. S. Hand.....50&7½&5@50&10&7½&5%
Machinists', Hammers.50&5@50&10&5%
Riveting and Tinners'.....40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—
Under 3 lb., per lb. 50¢.....80&10&10@85%
3 to 5 lb., per lb. 40¢.....80&10&10@85%
Over 5 lb., per lb 30¢..85@85&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—
Agricultural Tool Handles
Axe, Pick, &c.....60&5@60&10&5%
Hoe, Rake, &c.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—
Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—
Auger, assorted...gro. $2.50@2.85
Brad Awl.....*gro. $1.65@1.85*
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....*$2.40@2.63*
Hickory Tanged Firmer, gro. assorted.....*$2.15@2.40*
Apple Socket Firmer, gro. assorted.....*$1.75@1.95*
Hickory Socket Firmer, gro. assorted.....*$1.45@1.60*
Hickory Socket Framing, gro. assorted.....*$1.60@1.75*
File, assorted.....*gro. $1.30@1.40*
Hammer, Hatchet, Axe, &c...60&10@60&10&10%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...65@75¢
Plane Handles:
Jack, doz. 30¢; Jack, Bolted 75¢
Fore, doz. 45¢; Fore, Bolted 90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle....℔ gro. $0.85@$1.50

Hangers—
NOTE—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c

Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6	8
Single Doz.	$0.90	1.25	1.60	1.95	2.50

Barn Door, New England Pattern, Check Back, Regular:

Inch	3	4	5	6
Single Doz.	$1.30	1.85	2.50	3.00

Allith Mfg. Co.:
Reliable, No. 1.....per doz. $8.00
Reliable, No. 2.....per doz. $9.00
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10&5%
Roller Bearing.....70&5%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.60&10&2½%
Hinged.....net $6.40
Covered.....60&10%
Special.....70&5%
Lawrence Bros.:
Advance.....60&10%
Cleveland.....70&5%
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
Peerless.....70&5%
Sterling.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60%
Richards Mfg Co.:
Pioneer Wood Track No. 3..$2.15
Ball B'r'g St'l Track No. 10.$2.40
Roller B'r'g St'l Track No. 12.$2.30
Ball B'r'g St'l Track No. 13.$2.40
Roller B'r'g St'l Track No. 14.$2.30
Hero, Adj. Track No. 19.....50%
Adjustable Track Tandem Trolley Track No. 16.....50%
Seal, Steel Track No. 8.....$2.40
Auto Adj. Track No. 22..40&10%
Trolley B. D. No. 17.....$1.40
Trolley F. D. No. 120.....$2.35
Trolley F. D. No. 121.....$2.45
Trolley F. D. No. 150.....$2.60
Safety Underwriters F. D. No. 101.....$2.25
Tandem No. 44.....70&5%
Trolley F. D. No. 151.....$3.00
Palace, Adjustable Track No. 132.....40&10%
Royal, Adjustable Track No. 122.....40&10%
Ives' Wood Track No. 1.....$2.15
Trolley B. D. No. 20.....$1.35
Trolley B. D. No. 24.....$1.45
Trolley B. D. No. 27.....$1.50
Trolley B. D. No. 28.....$1.66
Roller Bearings Nos. 39, 40, 41, 43, 44.....70&5%
Anti-friction No. 42.....60&10%
Hinged Tandem No. 48.....60%
Folding Door B. B. Swivel No. 135.....30%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Freight Car Door.....60%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door.....50&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500....50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door.....50%
Zenith for Wood Track....50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle.....70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot.....60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives' Wood Track.....60&10%
L. T. Roller Bearing....60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet.....50%
Wilcox Auditorium Ball B'r'g.20%
Wilcox Barn Trolley No. 123..40%
Wilcox Elv. Door, Nos. 112 and 122½.....50%
Wilcox Elv. Door, No. 132....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Wideman Narrow Gauge Ball Bearing.....40%

Extra 50@10% often given.

For Track, see Rail.

Hangers— Garment—
Pullman Trouser, ℔ gro., No. 1, $9.00; No. 4, $24.00; No. 7, $7.50.
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Gate—
Myers' Patent Gate Hangers, ℔ doz. net.....$4.50

Hasps—
Griffin's Security Hasp.....50%
McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—
Regular list, first quality.40&7½%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—
Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—
Blind and Shutter Hinges—
Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	1	3	5
Doz. pair	$0.75	1.35	2.70

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	1	1½	2	2½
Doz. pair	$0.70	.65	.60	.55

Mortise Reversible Shutter (Buffalo, &c.):

No.	1	1½	2
Doz. pair	$0.70	.65	.60

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70&10@75%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 5, 11 and 13..75%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5%
Acme, Lull & Porter.....75&10%
Queen City Reversible.....75&10%
Shepard's Noiseless, Nos. 60, 65, 55.....75&10%
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
1868, Old Pat'n, Nos. 1, 3 & 5....75&10&5%
Tip Pat'n, Nos. 1, 3 & 5...75&10&5%
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5%
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with L't'es	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	.70	.70	.35

New England:
With Latch.....*doz.*...@$2.00
Without Latch...*doz.*...@$1.60
Reversible Self-Closing:
With Latch.....*doz.*...@$1.75
Without Latch...*doz.*...@$1.35
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches	$2.00	2.70	5.00
Hinges only	1.40	2.05	3.80
Latches only	70	.70	1.35

Pivot Hinges—
Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—
Holdback Cast Iron.....*gro. $9.00@$9.50*
Non-Holdback, Cast Iron.....*gro. $8.00@$8.50*
J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges.....40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7.....℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.50
Oxford, new list.....30%
Lawson Mfg. Co., Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....$9.00
Chief Ball B'r'g Floor Hinge.50%
Ohio Detachable Screen Door Hinge.....℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable.....℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k..℔ gro. pr.$9

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, &c., list December 20, 1904:

Light Strap Hinges...70%
H'vy Strap H'g's...75&5%
Light T Hinges.....65%
Heavy T Hinges.....60%
Extra H'y T H'g's.70&10%
Hinge Hasps.....50%
Cor. Heavy Strap...75&5%
Cor. Ex. Heavy T.70&10%

Extra 10@10&5%

Screw Hook and Strap. { *6 to 12 in..lb. 3½¢* / *1½ to 20 in..lb. 3¼¢* / *22 to 36 in..lb. 3 ¢*

Screw Hook and Eye:
¾ to 1 inch.....lb. 6 ¢
⅝-inch.....lb. 7 ¢
½-inch.....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

	Per doz.			
Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.50*

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....35%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Ft. Madison Cotton Hoe....10&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....
75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2½%
B. B. 6 in., Cultivator Hoe.....$3.15
B. B., 6½ in.....$3.35
Acme Wedding.....℔ doz., net, $4.35
W. & C. Tuning Shuffle Hoe, ℔ doz.$4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Bardsley's.....45%
Empire.....50%
Pullman.....50%

File and Tool—

Nicholson File Holders and File Handles.....33⅓&40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $10.80; ℔ doz.....$1.25

Hooks—Cast Iron—

Bird Cage, Reading.....40%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List.....50&10&10%
Clothes Line, Reading List.....40%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....40%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....80&10@..%
Wire C. & H. Hooks:.....
75&10@75&10&5%
Atlas, Coat and Hat:
Single Cases.....75%
10 Case Lots.....75&10%
Columbian Hdw. Co., Gem.....60&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....70&10%
Czar.....65%
V Brace.....70&10%
Czar Harness.....50&10%

Wrought Iron—

Box, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....doz. $1.05@$1.25
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Bush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz.....$1.30
Whiffletree.....lb. 3¾@6¢
Hooks and Eyes:
Brass.....60&10&5@60&10&10%
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horses.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....ft. 5 @ 6 ¢
3-ply Standard.....ft. 8 @ 9 ¢
4-ply Standard.....ft. 10 @11 ¢
3-ply extra.....ft. 11 @13 ¢
4-ply extra.....ft. 14 @16 ¢
Cotton Garden, ¾-in., coupled:
Low Grade.....ft. 8 @ 9 ¢
Fair Quality.....ft. 10 @11 ¢

Irons— Sad—

From 4 to 10.....lb. 2¾@3 ¢
B. B. Sad Irons.....lb. 3¼@3½¢
Chinese Laundry.....lb. 4¾@5 ¢
Chinese Sad.....lb. 4 @4¼¢
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	62	59	72	69
Tin'd Tops	*65*	*62*	*75*	*72*

New England Pressing..lb. 3¾@4¼¢

Pinking—

Pinking Irons.....doz. 50@60¢

Soldering—

Soldering Coppers, 2½ & 3.20@21¢
1½ & 2.....22@23¢

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&2%
Steel.....45%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&5%
Richards' Tiger Steel, No. 130.....40%

Kettles—

Brass, Spun, Plain.....20@25%
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Smith & Hemenway Co.....40&10%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....75%
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....70&10&2½%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge..per doz.$5.25@5.50
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—

Buffalo.....℔ gro. $13.00

Miscellaneous—

Farriers'.....doz. $3.00@3.25
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip.....gro.$1.15@1.20
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....doz. 65@70¢
Door, Por. Jap'd.....doz. 70@75¢
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....40%
Climax Shelf, No. 113.....40%
Trolley, No. 109.....40%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz. $4.25@4.85
Lift Tubular, No. 0.....
doz. $4.50@5.15
Hinge Tubular, No. 0.....
doz. $4.50@5.15
Other Styles.....40&10@40&10&5%

Bull's Eye Police—

No. 1, 2¾-inch.....$2.50@2.75
No. 2, 3-inch.....$2.75@3.00

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Richards' Bull Dog, Heavy, No. 125.40%
Richards' Trump, No. 127.....50%

Leaders, Cattle—

Small.....doz. 50¢; large, 60¢
Covert Mfg. Co., Cotton and Hemp.45%

Lifters, Transom—

R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.65*
75 feet	*$1.80*	*1.70*	*1.30*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 3½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ℔ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks— Cabinet—

Cabinet Locks...33⅓@33⅓&7½%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....40%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....50%

Padlocks—

Wrought Iron...75&10&5@80&8%
R. & E. Mfg. Co. Wrought Steel and Brass.....75@75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robison Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....40%

Machines—Boring—

Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Without Augers.

R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3..	$4.25	No. 1..$5.00
Improved No. 4..	3.75	No. 2.. 3.38
Improved No. 5..	2.75	

Jennings', Nos. 1 and 4.....35&5%
Millers' Falls.....5.75
Snell's, Rice's Pat. 2.50 2.75

Corking—

Reisinger Invincible Hand Power.....
℔ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—

Chandler's.....12½%

Washing—

Boss Washing Machine Co.: Per doz.
Champion Rotary Banner No. 1..$54.00
Standard Champion No. 1.....$48.00
Standard Perfection.....$26.00
Cinti Square Western.....$30.00
Uneeda American, Round.....$29.00

Mallets—

Hickory.....45&5@50%
Lignumvitæ.....45&5@50%
Tinners' Hickory and Applewood.....doz. 45&5@50%

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.).....10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria.50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheap.....all sizes, $1.75@2.00
Good.....all sizes, $2.25@2.50

	10	*12*	*14*	*16-in.*
High Grade..	*4.25*	*4.50*	*4.75*	*5.00*

Continental.....60&5%
Great American.....70%
Great American Ball B'r'g, new list.70%
Quaker City.....70%
Pennsylvania.....60&5%
Pennsylvania, Jr., Ball Bearing....60%
Pennsylvania Golf.....50%
Pennsylvania Horse.....33⅓&5%
Pennsylvania Pony.....40&5%
Philadelphia:
Styles M., S., C., K., T.....70&5%
Style A, all Steel.....60&5%
Style E, High Wheel.....70&10&5%
Drexel and Gold Coin, special list.50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899..85&10&10@90%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	*6*	*7*	*8*	*9*	*10*	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	25	.....50%
Coleman	13	12	12	11	11	.....net
New Haven..	23	21	20	19	18	...40&5%
Putnam	23	21	20	19	18	....33⅓%
New Putnam.	19	18	17	16	16	..10&10%
Western						℔ lb 8½¢

Jobbers' Special Brands.....
per lb. 8½@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd.	*45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head..	*1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: *Off list.*
Mfrs. or U. S. Standard.
Square, Blank.....$4.80
Hexagon, Blank.....$5.30
Square, Blank, C. T. & R..$5.00
Hexagon, Blank, C. T. & R.$5.70
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....$5.30
Hexagon, Blank.....$5.70
Square, Tapped.....$5.20
Hexagon, Tapped.....$5.60

Oakum—

Best or Government.....lb. 6½¢
Navy.....lb. 5 ¢
U. S. Navy.....lb. 6 ¢
Plumbers' Spun Oakum.....2½¢
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Chase or Paragon:
Brass and Copper.....50&10%
Tin or Steel.....65&10%
Zinc.....65&10%
Malleable, Hammers' Imp'ed, No. 1, $3.60; No. 2, $4; No. 3, $4.40. ℔ doz. 20%
Malleable, Hammers' Old Pattern, same list.....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can—

Per doz.
Sprague, Iron Handle....30@35¢
Sprague, Wood Handle...35@40¢
Sardine Scissors.....$1.75@$3.00
National.....50%
Stowell's Sprague.....℔ doz. 35@45¢

Egg—

Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope.....lb. 14@16¢

Rubber—

(Fair quality goods.)
Sheet, C. I.....8@10¢
Sheet, C. O. S.....9@13¢
Sheet, C. B. S.....10@14¢
Sheet, Pure Gum.....50@65¢
Sheet, Red.....40@50¢
Jenkins' '96. ℔ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...lb. 7@10 ¢
Cotton Packing.....lb. 16@25 ¢
Italian Packing.....lb. 9@12½¢
Jute.....lb. 4@ 4½¢
Russia Packing.....lb. 8@11 ¢

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz..	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co., ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos:	*lb.*
Building Felt	*2¾¢*
Mill Board, sheet, 40x40 in.	*3½¢*
Mill Board, roll, thicker than 1-16 inch	*3½¢*
Mill Board, 1-16 inch thick and less	*2½¢*

Per roll
Rosin Sized Sheathing: 500 sq. ft.
Light weight, 25 lbs. to roll 35¢@40¢
Medium weight, 30 lbs. to roll, 40@45¢
Heavy weight, 40 lbs. to roll.. 56@60¢
Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 2, 6 and 11 sq. ft. to lb. ton.....$38.00@40.00
Red Rope Roofing, 250 sq. ft. per roll.....$1.75

Tarred Paper—

1 ply (roll 300 sq. ft.), ton ..... $32.50@35.50
2 ply, roll 108 sq. ft. ..... 55@60¢
3 ply, roll 108 sq. ft. ..... 78@85¢
Slater's Felt (roll 500 sq. ft.) ..... 75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.) $2.75

Sand and Emery—

Flint Paper and Cloth ..... 60@60&10%
Garnet Paper and Cloth 25%
Emery Paper and Cl'h ..... 50&10@60%

Parers— Apple—

Advance ..... ℔ doz. $4.00
Baldwin ..... ℔ doz. $4.00
Bonanza Improved ..... each $6.50
Daisy ..... ℔ doz. $4.00
Dandy ..... each $7.50
Eureka Improved ..... each $20.00
Family Bay State ..... ℔ doz. $15.00
Improved Bay State ..... ℔ doz. $36.00
Little Star ..... ℔ doz. $5.00
New Lightning ..... ℔ doz. $7.00
Reading 72 ..... ℔ doz. $3.25
Reading 78 ..... ℔ doz. $6.25
Rocking Table ..... ℔ doz. $6.20
Turn Table '98 ..... ℔ doz. $6.00
White Mountain ..... ℔ doz. $5.00

Potato—

Saratoga ..... ℔ doz. $7.00
White Mountain ..... ℔ doz. $6.00

Picks and Mattocks—

List Feb. 23, 1899 ..... 70&65@75%
Cronk's Handled Garden Mattock, ℔ doz., $6.40 ..... 33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass ..... 60@60&10%
Iron, list Nov. 11, '85 ..... 60@60&10%

Pipe, Cast Iron Soil—

Carload lots.

Standard, 2-6 in. 60%
Extra Heavy, 2-6 in. 70%
Fittings 75%

Pipe, Merchant—

Carload Lots.

	Steel.		*Iron.*	
	Blk.	*Galv.*	*Blk.*	*Galv.*
⅛ & ¼ in.	67%	51%	65	49
⅜ & ½ in.	71%	59%	69	57
¾ to 6 in.	75%	65%	73½%	63½%
7 to 12 in.	70%	55%	68½%	53

Pipe, Vitrified Sewer—

Carload lots.

Standard Pipe and Fittings, 2 to 24 in.:

New England 68%
New York and New Jersey 71%
Maryland, Delaware, E. Pa. 75%
West. Pa. and West Va. 71%
Virginia 76%
Ohio, Michigan and Ky. 77%
Indiana 77%

NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual. ..... 40&10%
Bench, Second qual. ..... 50&10%
Molding ..... $33⅓&10%
Bailey's (Stanley R. & L. Co.) 40%
Chapin-Stephens Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality ..... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Toy and German ..... 40@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality ..... 40@40&10%
Bench, Second Quality ..... 50@50&10%
Molding ..... 33⅓@33⅓&10%
Adjustable Wood Bottom 60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.) 40%
Chaplin's Iron Planes ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) 35%
Ohio Tool Co.'s Iron Planes 60%
Sargent's ..... 60&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons ..... 25&10@30%
Buck Bros. 30%
Chapin-Stephens Co. ..... 30@30&10%
Ohio Tool Co. 30%
Stanley R. & L. Co. 35%
Union 50%
L. & I. J. White ..... 20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse ..... ℔ doz. $8.50

Plates—

Felloe ..... lb. 3½@4¼¢
Self-Sealing Pie Plates (S., S. & Co.) ℔ doz. $2.00 ..... 50%

Pliers and Nippers—

Button Pliers ..... 75&10@80%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.
Gas Pipe.. 7 8 10 12-in.
$2.00 $2.25 $3.00 $3.75
Acme Nippers ..... 50@50&5%
Cronk & Carrier Mfg. Co.:
American Button ..... 75&10%
Cronk's 60%
Improved Button ..... 60&10%
Stub's Pattern 50%
Combination and others 33⅓%
Heller's Farriers' Nippers, Pincers and Tools ..... 40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers ..... 30@30&10%
Swedish Side, End and Diagonal Cutting Pliers 50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds 40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels ..... 30@30&10&10%
Chapin's Imp. Brass Cor. 40@40&10&10%
Pocket Levels ..... 30@30&10&10%
Disston's Plumbs and Levels 70%
Disston's Pocket Levels 70%
C. E. Jennings & Co.'s Iron 33⅓%
C. E. Jennings & Co.'s Iron, Adjustable ..... 40&7½%
Stanley R. & L. Co. 45%
Stanley's Duplex 35%
Woods' Extension 33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $8.00; No. 4, $12.00 ..... 50%

Points, Glaziers'—

Bulk and 1-lb. papers, lb. 8½@9 ¢
½-lb. papers ..... lb. 9 @9½¢
¼-lb. papers ..... lb. 9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye ..... ℔ doz. $3.25
Ft. Madison Western ..... ℔ doz. $4.00

Police Goods—

Manufacturers' Lists ..... 25@25&5%
Tower's 25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.72 ..... 40%
Prestoline Paste ..... 40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz., 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans.. ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can ..... each, $0.65
Ladd's Black Beauty, gr. $10.00 ..... 50%
Joseph Dixon's, ℔ gr. $5.75 ..... 10%
Dixon's Plumbago ..... ℔ lb 8¢
Fireside ..... ℔ gr. $2.50
Gem, ℔ gr. $4.50 ..... 10%
Japanese ..... ℔ gr. $3.50
Jet Black ..... ℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail ..... each 70¢
Black Silk, ½ lb box ..... ℔ doz. $1.00
Black Silk, 5 oz. box ..... ℔ doz. $0.75
Black Silk, ½ pt. liq. ..... ℔ doz. $1.00

Poppers, Corn—

1 qt., Square ..... *gro. $9.00*
1 qt., Round ..... *gro. $10.00*
1½ qt., Square ..... *gro. $11.00*
2 qt., Square ..... *gro. $13.00*

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts ..... each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb ..... *each 45¢*
Fine Sporting, 1 lb ..... *each 75¢*
Rifle, ½-lb ..... *each 15¢*
Rifle, 1-lb ..... *each 25¢*
In Kegs:
12½-lb. kegs *$2.50*
25-lb. kegs *$4.50*
King's Semi-Smokeless:

Keg (25 lb bulk)	$12.00 $15.00
Half Keg (12½ lb bulk)	6.25 7.75
Quarter Keg (6¼ lb bulk)	3.25 4.00
Case 24 (1 lb cans bulk)	14.00 17.00
Half case 12 (1 lb c. bk)	7.25 8.75

Robin Hood Sm'less Shot Gun ..... 50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co. ..... 20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00 ..... 50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller $21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00 ..... 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 ..... 50%
Pearson No. 1, Cyclone Spike Puller, each $30.00 ..... 50%
Pelican, ℔ doz. $9.00 ..... 40&10%
Scranton, Case Lots:
No. 2B (large) $5.50
No. 3B (small) $5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots.. ℔ doz. $6.00
Diamond B, No. 3, case lots.. ℔ doz. $5.50
Giant No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15 ..... 40%

Pulleys, Single Wheel—

Inch	*1½*	*1¾*	*2*	*3*
Awning or Tackle, doz.	*$0.30*	*.35*	*.60*	*1.05*
Hay Fork, Swivel or Solid Eye, doz., ¼ in., $1.25; 5 in., $1.55				
Inch	*2*	*2¼*	*2½*	
Hot House, doz.	*$0.65*	*.85*	*1.20*	
Inch	*1¼*	*1½*	*1¾*	*2*
Screw, doz.	*$0.16*	*.19*	*.23*	*.30*
Inch	*1¾*	*2*	*2¼*	*2½*
Side, doz.	*$0.25*	*.40*	*.55*	*.60*
Inch	*1½*	*1¾*	*2*	*2½*

Stowell's:
Ceiling or End, Anti-Friction ..... 60&10%
Dumb Waiter, Anti-Friction ..... 60&10%
Electric Light 60%
Side, Anti-Friction ..... 60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in. ..... *16@19¢*
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in.. *16@19¢*
Acme ..... 1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 7, 2 in. ..... ℔ doz. 50%
Grand Rapids All Steel Noiseless 50%
Ideal ..... 70&10%
Niagara ..... 1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star ..... 1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern ..... 60@60&10%
Pitcher Spout ..... 80@80&10%
Wood Pumps, Tubing, &c. 45@50%
Barnes Dbl. Acting (low list) 50%
Barnes' Pitcher Spout ..... 75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co. $16.00
Daisy Spray Pump ..... ℔ doz. $7.20
Flint & Walling's, Fast Mail Hand, (low list) 55%
Flint & Walling's Fast Mail (low list) ..... 55&5%
Flint & Walling's Tight Top Pitcher 80%
National Specialty Mfg. Co., Measuring, $6.00 ..... 30%
Mechanical Sprayer $7.20
Myers' Pumps (low list) 50%
Myers' Power Pumps 50%
Myers' Spray Pumps 50%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	*2*	*2¼*	*2½*	*2¾*
	$2.20	*2.50*	*2.75*	*3.00*
Inch...	*3*	*3¼*	*3½*	*3¾*	*4*
	$3.30	*3.60*	*3.85*	*4.10*	*4.40*

Plunger Cup Leathers—Per 100:

Inch...	*2½*	*3*	*3½*	*4*
	$2.75	*3.85*	*5.00*	*6.00*

Punches—

Saddlers' or Drive, good ..... *doz. 50@75¢*
Spring, single tube, good quality ..... *$1.75@2.00*
Revolving (4 tubes) ..... *doz. $3.50@3.75*
Bemis & Call Co.'s Cast St'l Drive. 50%
Bemis & Call Co.'s Check 55%
Morrill's No. 1 (A.B.C.), ℔ doz. $15.50
No. 2, ℔ doz. $22.50 ..... 50%
Hercules, each $7.50 ..... 50%
Niagara Hollow Punches 40%
Niagara Solid Punches ..... 55&10%
Steel Screw, B. & K. Mfg. Co. 50%
Tinners' Hollow, P., S. & W. Co. 35@35&5%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44 ..... 60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ In.	
$2.50	*$3.00*	*$3.40*	*100 feet.*

Angular for Sq. Groove Wheels:

Small.	*Med.*	*Large.*	
$2.00	*$2.70*	*$3.60*	*100 feet.*

Sliding Door, Painted Iron ..... 2½@2¾¢
Sliding Door, Wrought Brass, 1⅛ in., lb., 36¢ 30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail ..... ℔ ft. 3¢
O. N. T. Rail ..... 2¾¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 180 ft., 1 in., $3.70; 1¼ in., $4.40.
O. N. T., ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in. ..... ℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft. No. 201, $4.00; No. 202, $4.40.
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢ 50%
None Better ..... ℔ ft. 3¾¢
Standard ..... ℔ ft. 4¢
Myers' Stayon Track 60%
Richards' Mfg. Co.:
Common 1 x 3-16 in., $2.75; 1¼ x 3-16, $3.25; 1¾ x 3-16, $3.50.
Special Hinged Hanger Rail $4.40
Fire Door Track, ℔ ft., 2½ x ⅝, 15¢; 3½ x ⅝, 9¢.
Lag Screw Rail, No. 65 ..... 60%
Gauge Trolley Track, ℔ ft., No. 31, 10¢; No. 32, 15¢; No. 33, 24¢.
Safety Door Hanger Co.'s Storm King Safety 60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail ..... ℔ ft. 1¾¢
Steel Rail, Plain 25%
Wrought Bracket, 1 3-16 in. ..... ℔ ft. 3¢
Wrought Bracket, 1½ x 5-16.. ℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢ 60%
P. L. B. Steel Rail ..... ℔ 100 ft. $3.00
No. 0, 1 x 3-16 ..... ℔ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn $3.25
Fort Madison Blue Head Lawn $2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net $4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.. 75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00.... 75&25%
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60 .....
Anticlog Lawn, ℔ doz. $4.00
Malleable Garden ..... 70&10%
Kohler's:
Lawn Queen, 20-tooth ..... ℔ doz. $3.45
Lawn Queen, 24-tooth ..... ℔ doz. $3.60
Paragon, 20-tooth ..... ℔ doz. $2.75
Paragon, 24-tooth ..... ℔ doz. $3.00
Steel Garden, 14-tooth ..... ℔ doz. $2.88
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden ..... 75&5%

Rasps, Horse—

Disston's 75%
Heller Bros.' ..... 70&5@70&10&5%
McCaffrey's American St'd.. 60&10&5%
New Nicholson ..... 70&10@75%
See also Files.

Razors—

Borasic 60%
Fox Razors, No. 42.. ℔ doz. $20.00 } 40% Dis.
Fox Razors, No. 44.. ℔ doz. $20.00 } 40% Dis.
Fox Razors, No. 82, Platina... ℔ doz. $25.00 } 40% Dis.
Red Devil 60%
Sage & Hatch:
Arbo Anti-Rust ..... ℔ doz. $10.00
Herbrand ..... ℔ doz. $6.00
Barber ..... ℔ doz. $6.00
Silberstein:
Carbo Magnetic $18.00
Griffon, No. 65 ..... $15.00
Griffon, No. 60 ..... $12.00
All other Razors 40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo 20%
Aluminum, German Silv., Bronze. 25%
1240 N, 124 N 20%
3004 N, 06 N, 6 RM, G 9 ..... 25%
4 N, 6 PN, 24 N, 26 PN 20%
2904 P 33⅓%
2904 PN 33⅓%
0924 N 33⅓%
02084 N 33⅓%
002904 PN 33⅓%
802 N 33⅓%
986 PN, 2904 N, 974 PN 25%
5009 PN, 5009 N 20%
Competitor, 102 P, 102 PN, 202 P, 202 PN, 102 PR, 202 PR 20%
304 P, 304 PN, 00304 P, 00304 PN. 33⅓%

Registers—*List July 1, 1903.*

Black Jap 75%
Bronzed 75%

Revolvers—

Single Action ..... 95¢@$1.00
Double Action, except 44 cal. $1.85
Double Action, 44 caliber $2.00
Automatic $3.45
Hammerless $4.00

NOTE.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in. ..... *per doz. $2.25@$2.50*
17 in. ..... *per doz. $2.50@$2.75*
18 in. ..... *per doz. $2.75@$3.00*

Rings and Ringers—

Bull Rings—

	2	*2½*	*3 inch.*
Steel	*$0.70*	*0.75*	*0.80 doz.*
Copper	*$1.00*	*1.15*	*1.40 doz.*

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2¼ in., $1.50; 3 in. $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes $4.00@4.50
Hill's Ringers, Gray Iron ..... *doz. 50@55¢*
Hill's Ringers, Malleable Iron .. *doz. 70@75¢*
Blair's Rings ..... *per gro. $4.75@5.25*
Blair's Ringers. per doz. $0.60@ .65
Brown's Rings ..... *per gro. $5.00@5.50*
Brown's Ringers. per doz. $0.60@ .65

Rivets and Burrs—

Copper ..... 50&10@60%
Iron or Steel ..... 75@75&5%

Rollers—

Acme, Stowell's Anti-Friction 50%
Barn Door, Sargent's list 60%
Cronk's Stay ..... 72¢
Cronk's Brinkerhoff ..... 90¢
Lane's Stay 40%
Richards' Stay:
Handy Adj. and Reversible No. 53. 50%
O. K. Adj. and Reversible No. 58. 50%
Lag Screw, Nos. 55 and 57 ..... 50%
Fire Door, No. 59 ..... 40%
Favorite, No. 54 ..... 40%
Stowell's Barn Door Stay.. ℔ doz. $1.00
Swett's Anti-Friction 50%
Screw and Spike Stay ..... ℔ doz. 65¢
Hinge Adjustable Stay ..... ℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure ..... *lb. 11¾@12¢*
Sisal, 7-16 in. diam. and larger:
Mixed ..... *lb. 8@8¼¢*
Pure ..... *lb. 9¼@9¾¢*
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed ..... *lb. 8@8¼¢*
Pure ..... *lb. 9¼@9¾¢*

Sisal, Tarred, Medium Lath Yarn:
Mixed ..... *lb.* 7¾¢
Pure ..... *lb.* 9@9¼¢
Cotton Rope: *Lb.*
Best, ¼-in. and larger ..... *16¢*
Medium, ¼-in. and larger ... *14¢*
Common, ¼-in. and larger . *10½¢*
Jute Rope:
Thread No. 1, ¼-in. & up. *lb. 6½¢*
Thread No. 2, ¼-in. & up, lb. *5¾¢*
Old Colony Manila Transmission Rope ..... ℔ lb 17½ ¢

Wire Rope—

Galvanized ..... *42½&2½%*
Plain ..... *50&2½%*

Ropes, Hammocks—

Covert Mfg. Co.:
Jute 50%
Sisal ..... 30&10%
Covert Saddlery Works..... 50&5%

Rules—

Boxwood ..... *60&10&10%*
Ivory ..... *35&10@35&10&5%*
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Flexifold ..... 27½&10&10&2½%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood ..... 35&10%
Folding, Steel ..... 33⅓&10%
Lufkin's Steel ..... 50&10%
Lufkin's Lumber 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag 40%
Zig Zag, Pin Joint 42½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—
See *Balance, Sash.*

Sash Locks—
See *Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers
See *Stuffers or Fillers, Sausage.*

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 50%
Band ..... 50&10&60%
Cross Cuts ..... 35&5%
Mulay, Mill and Drag 50%
One-Man Saw 40%
Wood Saws 40%
Hand, Compass, &c 40%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&10%
Disston's:
Circular, Solid and Ins'ted Tooth..50%
Band, 2 to 14 in. wide 60%
Band, ⅛ to 1¾ 60%
Crosscuts 50%
Narrow Crosscuts 55%
Mulay, Mill and Drag 50%
Framed Woodsaws 35%
Woodsaw Blades 35%
Woodsaw Rods 25%
Hand Saws, Nos. 12, 99, 9, 16, d100, D8, 120, 76, 77, 8 ..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination 30%
Compass, Key Hole, &c 25%
Butcher Saws and Blades 35%
C. E. Jennings & Co.'s:
Back Saws 25%
Butcher Saws 30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws 30%
Hand Saws ..... 20&2½%
Wood Saw Blades 35%
Millers Falls:
Butcher Saws ..... 15&10%
Star Saw Blades ..... 15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws 50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts ..... 40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws 50%
Back Saws ..... 25@25&7½%
Butcher Saws ..... 35@35&7½%
Hand Saws ..... 25@25&7½%
Hand Saws, Bay State Brand 45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws ..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades.....35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws..... 50%

Hack Saws—

Atkins' Hack Saw Blades A A A..35%
Disston's:
Concave Blades 25%
Keystone 40%
Hack Saw Frames 30%
Fitchburg File Works, The Best....35%
C. E. Jennings & Co.'s:
Hack Saw Frames, Nos. 175, 180.... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades..... 40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades..... 35%
Diamond Hack Saw Frames..... 50%
Star Hack Saws and Blades.....15&10%
Sterling Hack Saw Blades....30&10&5%
Sterling Hack Saw Frames...30&10&10%

Scroll—

Barnes' No. 7, $15 ..... 25%
Barnes' Scroll Saw Blades..... 60%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.00..... 15&10%
Rogers, complete, $4.00..... 15&10%

Scalers, Fish—

Covert's Saddlery Works..... 60&10%

Scales—

Family, Turnbull's .... *50@50&10%*
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... *doz. $5.50*
Two Platforms, ½ oz. to 8 lbs. ..... *doz. $16.00*
Union Platform, Plain *$1.70@1.90*
Union Platform, Stpd. *$1.85@2.15*
Chatillon's:
Eureka 25%
Favorite 40%
Grocers' Trip Scales 50%
Chicago Scale Co.:
The "Little Detective"....25 lbs 50%
Union or Family No. 2 ..... 60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list)..25@35%
"The Standard" Portables..... 50%
"The Standard" R. R. and Wagon.50%

Scrapers—

Box, 1 Handle ..... *doz. $2.00@2.25*
Box, 2 Handle ..... *doz. $2.60@2.85*
Ship .... *Light, $2.00; Heavy, $4.50*
Adjustable Box Scraper (S. R. & L. Co.), $6.00 ..... 45%
Chapin-Stephens Co., Box....50@50&10%

Screens, Window and Frames—

Air Line Pattern Screens..... 60&10%
Flyer Pattern Screens..60&10@60&10&5%
Maine Screen Frames..... 40&10&5%
Perfection Screens.....60&10@60&10&5%
Phillips' Screen Frames...60&5@60&10%
See also *Doors.*

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@ 2.75; 1⅛, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech. doz. *30@30&5%*
Hand, Wood ..... *30@30&5%*
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand..30@30&10%
Ohio Tool Co., Bench and Hand..30%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 ..... *75&17½%*
Coach, Gimlet Point, list Oct. 1, '99 ..... *75&12½%*
Hand Rail, list Jan. 1, '81 ..... *70&10@75%*

Jack Screws—

Standard List ..... *75&10@80&5%*
Millers Falls..... 50&10&10%
Millers Falls, Roller..... 50&10%
P., S. & W..... 50@50&5%
Sargent ..... 70&10%
Swett Iron Works..... 75&10@80&5%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron .... *50@50&10%*
Flat or Round Head, Brass .... *50@50&10%*

Set and Cap—

Set (Iron) *80%*
Set (Steel), net advance over Iron *25%*
Sq. Hd. Cap *75%*
Hex. Hd. Cap *75%*
Rd. Hd. Cap ..... *60&10%*
Fillister Hd. Cap ..... *60&10&10%*

Wood—

List July 23, 1903.
Manufacturers' printed discounts:
Flat Head, Iron .... *87½&10&10%*
Round Head, Iron ... *85 &10&10%*
Flat Head, Brass ... *85 &10&10%*
Round Head, Brass .. *80 &10&10%*
Flat Head, Bronze ... *77½&10&10%*
Round Head, Bronze . *75 &10&10%*
Drive Screws ..... *87½&10%*

Scroll Saws—
See *Saws, Scroll.*

Scythes— *Per doz.*

Prices announced for next season:
Clipper Pattern, Grass *$6.20*
Full Polished, Clipper *$6.75*
Grain *$8.00*
Clipper, Grain *$8.25*
Weed and Bush *$6.25*

Seeders, Raisin—

Enterprise ..... 25@30%

Sets— Awl and Tool—

Aiken's Sets, Awl and Tools:
No. 20, ℔ doz. $10.00..... 50&10&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18.. 15&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel..... ℔ doz sets $9.00
Octagon ..... *gro. $3.50@3.75*
Buck Bros..... 27½%
Cannon's Diamond Point, ℔ gro. $12..25%
Mayhew's ..... ℔ gro. $9.00
Snell's Cannon's Diamond Point.... ℔ gro. $7.20
Snell's Cor'gated, Cup Pt... ℔ gro. $7.20
Snell's Knurled, Cup Pt.... ℔ gro. $7.20
Springfield Mach. Screw Co.: Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—

Regular list ..... *75@75&10%*

Saw—

Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut..... 30%
Plate 20%
Disston's Star and Monarch..... 25%
Morrill's No. 1, $15.00..... 50%
Nos. 3 and 4, Cross Cut, $20.63.... 50%
No. 5, Mill, $30.00..... 50%
Nos. 10, 11, 95, $15.63..... 50%
No. 1 Old Style, $10.00..... 50%
Special, $16.25..... 50%
Giant Royal, Cross Cut..... ℔ doz. $8.50
Royal, Hand..... ℔ doz. $5.00
Taintor Positive..... ℔ doz. $6.75

Shaving—

Fox Shaving Sets, No. 30..... ℔ doz., net, $24.00

Sharpeners, Knife—

Chicago Wheel & Mfg. Co..... 65%

Shaves, Spoke—

Iron ..... *doz. $1.10@1.25*
Wood ..... *doz. $1.75@2.25*
Bailey's (Stanley R. & L. Co.)....45%
Razor Edge (Stanley R. & L. Co.)...35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ℔ doz. $9.00..... 15&10%
Wood's F1 and F2..... 50%

Shears—

	7	8	9 in.
Cast Iron ..			
Best	*$16.00*	*18.00*	*20.00 gro.*
Good	*$13.00*	*15.00*	*17.00 gro.*
Cheap ..	*$5.00*	*6.00*	*7.00 gro.*

Straight Trimmers, &c.:
Best quality Jap .... *70@70&10%*
Best quality, Nickel .. *60@60&10%*
Fair quality, Jap .... *80@80&5%*
Fair quality, Nickel .. *75@7"&10%*
Tailors' Shears ..... *40@40&10%*
Acme Cast Shears..... 40@40&5%
Heinisch's Tailor's Shears..... 10%
Wilkinson's Hedge, 1900 list..... 45%
Wilkinson's Branch, Lawn & Border.40%
Wilkinson's Sheep, 1900 list..... 50%

Tinners' Snips—

Steel Blades ..... *20&5@20&10%*
Steel Laid Blades ..... *40&10@50%*
Forged Handles, Steel Blades, Berlin, 40@40&10%
Heinisch's Snips..... 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in..... 50%
Niagara Snips..... 40%
P., S. & W. Co..... 20%

Pruning Shears and Tools

Cronk's Grape Shears..... 33⅓%
Cronk's Pruning Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades..40@40&5%
Orange Shears..... 50&10@50&20
Grape ..... 40&10@50%
Tree Pruners..... 75%
P., S. & W. Co..... 33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction..... 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 40%
R. & E. list..... 33⅓%
Wrightsville Hatfield Pattern..... 80%

Sliding Shutter—

Reading list..... 40%
R. & E. list..... 33⅓%
Sargent's list..... 50&10%

Shells—Shells, Empty—

Brass Shells, Empty:
First quality, all gauges..... 60&5%
Climax, Club, Rival, 10 and 12 gauge ..... 65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge..25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge..20%
Climax, Union, League, New Rival, 10 and 12 gauge..... 25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge..... 33⅓&5%
Robin Hood, Low Brass..... 20&10%
Robin Hood, High Brass..... 30&10%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade ..... *40&5%*
Loaded with Smokeless Powder, high grade ..... *40&10&10%*
Robin Hood Smokeless Powder:
Robin Hood, Low Brass..... 50%
Comets, High Brass..... 50&10&5%

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... *per keg $4.00*
Steel ..... *per keg $3.75*
Burden's, all sizes..... ℔ keg $3.90

Shot—

Drop, up to B, 25-lb. bag *$1.65*
Drop, B and larger ..... *per 25-lb. bag, $1.90*
Buck, 25-lb. bag *$1.90*
Chilled, 25-lb. bag *$1.90*

Shovels and Spades—

Association List, Nov. 15, 1902 .*40%*

Sieves and Sifters—

Hunter's Imitation ..... *gro. $10.50@11.00*
Hunter's Genuine ..... *per gro. $12.00@12.50*
Buffalo Metallic Blued, S. S. Co., ℔ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ℔ doz., $2.00..... 20%

Sieves, Seamless Metallic

	—Per dozen.—			
Mesh	*14*	*16*	*18*	*20*
Iron Wire....	*$1.05*	*1.05*	*1.10*	*1.20*
Tinned Wire..	*$1.15*	*1.15*	*1.20*	*1.30*

Sieves, Wooden Rim—
Nested, 10, 11 and 12 Inch.
Mesh 18, Nested .... *doz. $0.90@0.95*
Mesh 20, Nested .... *doz. $1.00&1.05*
Mesh 24, Nested .... *doz. $1.30@1.40*

Sinks, Cast Iron—

Standard list ..... *60@60&10%*
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron ..... *80&10@80&10&10%*
Steel ..... *40@40&10%*

Slates, School—
Factory Shipments.
"D" Slates ..... *50@50&10%*
Eureka, Unexcelled Noiseless .. *60&5 tens*
Victor A, Noiseless ..... *60&5 tens &5%*

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... *40@40&10%*
Covert Mfg. Co.:
Derby ..... 30&2%
High Grade..... 35%
Jockey 35%
Trojan ..... 30&2%
Yankee ..... 30&2%
Yankee Roller..... 30&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Solid Swivel..... 60%
Sargent's Patent Guarded....66⅔&10%

Snaths—

Scythe *50%*

Snips, Tinners—See *Shears.*

Spoons and Forks—
Silver Plated—

Good Quality ..... *50&10@60&5%*
Cheap ..... *60@60&10%*
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand..... 50&10%
Anchor, Rogers Brand..... 60%
Wm. Rogers & Son..... 60&10%

Miscellaneous—

German Silver ..... *60@60&5%*
Cattaraugus Cutlery Co.:
Seneca Silver..... 50%

Tinned Iron—

Teas ..... *per gro. 45@50¢*
Tables ..... *per gro. $0.90@1.00*

Springs— Door—

Chicago (Coil)..... 40&10%
Gem (Coil)..... 20%
Pullman (Coil)..... 25%
Reliance (Coil)..... 40&10%
Star (Coil)..... 30%
Torrey's Rod, 39 in..... ℔ doz. $1.10
Victor (Coil)..... 50&10&10%

Carriage, Wagon, &c.—

1¼ in. and Wider: *Per lb*
Black ..... *4@4¼¢*
Half Bright ..... *4@4¼¢*
Bright ..... *4½@4¾¢*
Painted Seat Springs:
1½ x 2 x 26 ..... *per pr. 42¢*
1½ x 3 x 28 ..... *per pr. 70¢*

Sprinklers, Lawn—

Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24..... 30%

Squares—

Nickel plated .. } *List Jan. 5, 1900.*
Steel and Iron . } *75@75&5%.*
Rosewood Hdl. Try Square and T-Bevels ..... *60&10&10@70%*
Iron Hdl. Try Squares and T-Bevels ..... *40&10@40&10&10%*
Disston's Try Sq. and T-Bevels...70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2..... 50%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz. $1.00*
Good Grade ..... *doz. $1.25*
Tinned Iron ..... *doz. $0.75@1.25*
Iron, Porcelain Lined ... *doz. $1.75*

Staples—

Barbed Blind ..... *lb. 6@6½¢*
Electricians', Association list .. *80&10&10&10%*
Fence Staples, Plain, $2.25; Galvanized *$2.55*
Poultry Netting Staples ..... *per lb. 3¼@3½¢*
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—

Dick's 30%
Foster Bros. 30%
C. & A. Hoffmann's..... 40%

Steelyards— .... 30@30&10%

Stocks and Dies—

Blacksmiths' ..... *50@50&10%*
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates..... 25%
Gardner Die Stocks No. 1..... 50%
Gardner Die Stocks, larger sizes....40%
Green River..... 25%
Lightning Screw Plate..... 25%
Little Giant..... 25%
Reece's New Screw Plates..... 25%

Stone—Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $8.00 ℔ gro., 12 in., $10.00.
Norton Emery Scythe Stones:
Less than gross lots..... ℔ gro. $9.00
One gross or more..... ℔ gro. $7.20
Lots of 10 gross or more.. ℔ gro. $6.00

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ℔ gro. $12.00
Lamoille S. S. ℔ gro. $11.00
White Mountain S. S. ℔ gro. $9.00
Green Mountain S. S. ℔ gro. $6.00
Extra Indian Pond S. S. ℔ gro. $7.50
No. 1 Indian Pond S. S. ℔ gro. $7.00
No. 2 Indian Pond S. S. ℔ gro. $4.50
Leader Red End S. S. ℔ gro. $4.50
Emery and Corundum, 10 in. ℔ gro. $9.00 } 33⅓%
Pure Corundum, 10 in. ℔ gro. $12
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8
Emery Scythe Rifles, 3 Coat, $10
Emery Scythe Rifles, 4 Coat, $12
Balance of 1904 list 33⅓%

Oil Stones, &c.—

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit 50%
Gem Corundum Axe, Single or Double Grit 55%
Gem Corundum Slips 55%
Gem Corundum Razor Hones 50%
Pike Mfg. Co., 1901 list: ℔ lb.
Arkansas St. No. 1, 3 to 5½ in. $2.80
Arkansas St. No. 1, 5½ to 8 in. $3.50
Arkansas Slips No. 1 $4.00
Lily White Washita, 4 to 8 in. 60¢
Rosy Red Washita, 4 to 8 in. 60¢
Washita St., Extra, 4 to 8 in. 50¢
Washita St., No. 1, 4 to 8 in. 40¢
Washita St., No. 2, 4 to 8 in. 30¢
Lily White Slips 90¢
Rosy Red Slips 90¢
Washita Slips, Extra 80¢
Washita Slips, No. 1 70¢
Washita Slips, No. 2 40¢
India Oil Stones (entire list) 33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit 33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit 33⅓%
Quickcut Emery Rubbing Bricks 33⅓%
Hindostan No. 1, R'g'lar. ℔ lb 8¢
Hindostan No. 1, Small ℔ lb 10¢
Axe Stones (all kinds)
Turkey Oil Stones, Extra, 5 to 8 in. ℔ lb 80¢
Queer Creek Stones, 4 to 8 in. 20¢
Queer Creek Slips 40¢
Sand Stone 6¢
Belgian, German and Swaty Razor Hones 50%
Natural Grit Carving Knife Hones ℔ doz. $3.00
Quick Edge Pocket Knife Hones ℔ doz. $2.50
Mounted Kitchen Band Stone. ℔ doz. $1.50

Stoners, Cherry—

Enterprise 25@30%

Stoppers, Bottle—

Victor Bottle Stoppers ℔ gro. $9.00

Stops— Bench—

Millers Falls 15&10%
Morrill's, ℔ doz., No. 1, $10.00 50%
Morrill's, No. 2, $12.50 50%

Door—

Chapin-Stephens Co. 60@60&10%

Plane—

Chapin-Stephens Co. 20%

Straps— Box—

Cary's Universal, case lots. 20&10&10%

Hame—

Covert's Saddlery Works 60&10%

Stretchers, Carpet—

Cast Iron, St'l Points, doz. 55@60%
Socket, doz. $1.75
Excelsior Stretcher and Tack Hammer Combined, ℔ doz. $6.00 20%

Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&7½%
National Specialty Co., list Jan. 1, 1902 30&5%

Sweepers, Carpet—

National Sweeper Co.: ℔ doz.
Auditorium, Roller Bearing (36 in. case), Nickel $54.00
Mammoth, Roller Bearing (30 in. case), Nickel $60.00
Marion, Roller Bearing, regular finishes, full Nickel $24.00
Marion Queen, Roller Bearing, full Nickel $24.00
Monarch, Roller Bearing, N'kel. $22.00
Monarch, Roller B'r'g, Jap'ned. $20.00
Transparent, Roller Bearing, Plate Glass Top, Nickel $36.00
Monarch Extra, Roller Bearing, (17-in. case), Nickel $36.00
Monarch Extra, Roller Bearing (17-in. case), Japanned $33.00
National Queen, Fancy Veneers. $27.00
Perpetual, Regular B'r'gs, Nkl. $20.00
Perpetual, Regular B'r'gs, Jap. $18.00
Triple Medal $24.00

NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Tacks, Finishing Nails, &c.

New List, May 1, 1905.

American Carpet Tacks 90&87½%
American Cut Tacks 90&87½%
Swedes Cut Tacks 90&87½%
Swedes Upholsterers' Tacks 90&50%
Gimp Tacks 90&50%
Lace Tacks 90&50%
Trimmers' Tacks 90&87½%
Looking Glass Tacks 65%
Bill Posters' and Railroad Tacks 90&50%
Hungarian Nails 90&87½%
Finishing Nails 70%
Trunk and Clout Nails 80&5%

NOTE.—The above prices are for Standard Weights. An extra 5% is given on Medium Weights, and an extra 10&5% is given on light weights.

Miscellaneous—

Double Pointed Tacks 90&6 or 7 tens
Steel Wire Brads. R. & E. Mfg. Co.'s list 50&10@60%
See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, S., S. & Co.	30-gal. $3.40
Emerald, S., S. & Co.	60-gal. $4.25
Queen City, S., S. & Co.	30-gal. $3.65
Queen City, S., S. & Co.	60-gal. $4.50

Tapes, Measuring—

American Asses' Skin 40&10@50%
Patent Leather 25@30&5%
Steel 40@40&10%
Chesterman's 25@25&5%
Eddy Asses' Skin 40&10@50%
Eddy Patent Leather 25@30&5%
Eddy Steel 40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin 40&10@50%
Favorite, Duck and Leather 25&5@25&10%
Metallic and Steel, lower list 35@35&5%
Pocket 35@35&5%
Lufkin's:
Asses' Skin 40&10@50%
Metallic 30@30&5%
Patent Bend, Leather 25&5@25&10%
Pocket 40@40&5%
Steel 33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger per 100 lbs. $3.00

Thermometers—

Tin Case 80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop 80&2½%
Monitor, Cross Head, &c. 70%

Brick Ties—

Niagara Brick Ties 25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works 60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White 20@20&5%

Hay—

Myers' Hay Tools 50%
Stowell's Hay Carriers 50%
Stowell's Hay Forks 50%
Stowell's Fork Pulleys 50%

Saw—

Atkins' Cross Cut Saw Tools 40%
Simonds' Improved 33⅓%
Simonds' Crescent 25%

Ship—

L. & I. J. White 25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro. $11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Oneida Pattern 75&10@75&10&5%
Newhouse 45@45&5%
Hawley & Norton 65%
Victor and Oneida 70&10@70&10&5%
O. C. Jump (Blake Pat.) 60&5@60&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 8½@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ℔ doz. $13.25
No. 3, Rat, ℔ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ℔ doz. $5.25; case of 72 ℔ gro. $4.70 doz.
No. 4, Mouse, ℔ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ℔ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E 1 50%

Trowels—

Disston Brick and Pointing 30%
Disston Plastering 25%
Disston "Standard Brand" and Garden Trowels 35%
Kohler's Steel Garden Trowels, 5 in. ℔ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ℔ gro. $6.00
Never-Break Steel Garden Trowels ℔ gro. $6.00
Rose Brick and Plastering 25&5%
Woodrough & McParlin, Plastering 25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern 50&10%
Western Pattern 60&10%
Handy Trucks ℔ doz. $16.00
Grocery ℔ doz. $15.00
Daisy Stove Trucks, Improved Pattern ℔ doz. $18.50
McKinney Trucks each $10.00
Model Stove Trucks ℔ doz. $18.50

Tubs, Wash—*No. 1 2 3*

Galvanized, per doz. $4.50 5.00 5.75
Galvanized Wash Tubs (S., S. & Co.):
No. 1 2 3 10 20 30
Per doz., net $5.70 6.30 7.20 6.00 7.20 8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls	*22@24¢*	
No. 12, ¼ and ½-lb. Balls	*18@20¢*	
No. 18, ¼ and ½-lb. Balls	*16@18¢*	
No. 24, ¼ and ½-lb. Balls	*16@18¢*	
No. 36, ¼ and ½-lb. Balls	*15@17¢*	
Chalk Line, Cotton ½-lb. Balls		*30¢*

Cotton Mops, 6, 9, 12 and 15 lb. to doz. 9½@11¢
Cotton Wrapping, 5 Balls to lb., according to quality 13½@20¢
American 2-Ply Hemp, ¼ and ½-lb. Balls 13@14¢
American 3-Ply Hemp, 1-lb. Balls 13@14¢
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine) 8½¢
India 3-Ply Hemp, 1-lb. Balls 8½¢
India 3-Ply Hemp, 1½-lb. Balls. 7@8¢
2, 3, 4 and 5-Ply Jute, ½-lb. Balls 9@10¢
Mason Line, Linen, ½-lb. Bls. 46¢
No. 26½ Mattress, ¼ and ½-lb. Balls 37¢
Wool, 3 to 6 ply B 13½¢; A 5¢

Vises—

Solid Box 60&10@60&10&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable 40%
Standard 40%
Amateur 25%
Columbian Hdw. Co. 40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2, $12.50; No. 3, $10.00.
Machinist and Tool Makers' No. 4, $12.50; No. 5, $7.00; No. 6, $10.00; No. 10, $21.50.
Jewelers' No. 7 $4.00
Fisher & Norris Double Screw. 15&10%
Hollands':
Machinists' 40@40&5%
Keystone 65&5@70%
Lewis Tool Co. 20@30%
Merrill's 20%
Millers Falls 60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip 20%
Parker's:
Victor 20@25%
Regulars 20@25%
Vulcan's 40@45%
Combination Pipe 55@60%
Prentiss 20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists' 40%
Jewelers' 33⅓%
Snediker's X. L. 33⅓%
Stephens' 33⅓%
Williamson Mfg. Co. Double Swivel. 40%

Saw Filers—

Disston's D 3 Clamp and Guide, ℔ doz. $30 25%
Perfection Saw Clamps, ℔ doz. $5.00
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3 45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip 15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise 60&10%
Holland's Combination Pipe 60@60&5%
Massey's Quick Action Pipe 40%
Parker's Combination Pipe:
87 Series 60%
187 Series 60&5%
No. 870 40%
Williamson Mfg. Co. Double Swivel Combination Pipe 40%

Wads—*Price per M.*

B. E., 11 up 60¢
B. E., 9 and 10 70¢
B. E., 8 80¢
B. E., 7 80¢
P. E., 11 up $1.00
P. E., 9 and 10 1.25
P. E., 8 1.50
P. E., 7 1.50
Dis. 15%
Ely's B. E., 11 and larger $1.70@1.75
Ely's P. E., 12 to 20 $3.00@3.25

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow Ware:
Enameled 50@55&10%
Ground 55@60&10%
Plain or Unground 60@65&10%
Country Hollow Ware, per 100 lbs. $2.75@3.00
White Enameled Ware:
Maslin Kettles 70%
Covered Wares
Tinned and Turned 40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware 50&20%
Agate Nickel Steel Ware, Specials 60&15%
Iron Clad Ware 70&10%
Lava, Enameled 40&10%
Never Break Enameled 50%

Tea Kettles—

Galvanized Tea Kettles:

Inch	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles 65@65&5%
Avery Kettles 60%
Porcelained 50&5@50&10%
Never Break Spiders and Griddles 65&5%
Never Break Kettles 60%
Solid Steel Spiders and Griddles 65&5%
Solid Steel Kettles 60%

Warmers, Foot—

Pike Mfg. Co., Soapstone 40@40&10%

Washboards—

Solid Zinc: ℔ doz.
Crescent, family size, bent frame. $3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector $2.90
Cable Cross, family size, stationary protector $3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back $2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back $3.25

Washers—Leather, Axle—

Solid 80&10@80&10&10%
Patent 90@90&5%
Coil: ⅞ 1 1⅛ 1¼ *inch.*
10¢ 11¢ 12¢ 13¢ *per box*

Iron or Steel—

Size bolt 5-16 ⅜ ½ ⅝ ¾
Washers $4.95 4.05 2.75 2.55 2.35
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add ½¢ to list.

Cast Washers—

Over ½ inch, barrel lots per lb. 1¾@2¢

Wedges—

Oil Finish lb. 2.15@2.30¢

Weights—Hitching—

Covert Mfg. Co. 40&2%
Covert's Saddlery Works 60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District $25.00
Southern Territory $19.00@20.00
Western and Central Districts $20.00@21.00

Wheels, Well—

8-in., $1.50@1.55; 10-in., $1.65@1.70; 12-in., $2.25@2.35; 14-in., $3.40@3.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9 80&5@80&7½%
10 to 18 80@80&5%
19 to 26 80&10@80&10&5%
27 to 36 80&5@80&10%
Galvanized:
6 to 9 77½@77½&5%
10 to 14 72½@72½&5%
15 to 16 75&7½@75&10&2½%
19 to 26 75&5@75&10%
27 to 36 72½&5@72&7½%
Coppered:
6 to 9 77½@77½&5%
10 to 14 77½@77½&7½%
15 to 18 75&10@75&10&2½%
19 to 26 75&10&5@80%
27 to 36 75@75&5%
Tinned:
6 to 14 77½@77½&7½%
15 to 18 75&5@75&10%
Annealed, Steel and Tinned, on Spools 70&10&10@70&10&10&10%
Brass and Copper on Spools 60&10@60&10&10%
Brass, list Feb. 26, '96 30&5%
Copper, list Feb. 26, '96 15%
Cast Steel Wire 50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903 90&10&10&10@..%

Wire Cloth and Netting—

Galvanized Wire Netting 80&15@80&17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft. 3 ¢
Nos. 4 and 5 Mesh, sq. ft. 3½¢
No. 6 Mesh, sq. ft. 3½¢
No. 8 Mesh, sq. ft. 4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural 75&10@75&10&10%
Alligator or Crocodile. 70&10@75%
Baxter Pattern S Wrenches 70&5@70&10%
Drop Forged S 45@45&5%
Acme 60&10%
Alligator Pattern 70%
Bull Dog 70%
Bemis & Call's:
Adjustable S 40%
Adjustable S Pipe 40%
Bemis Pipe 60%
Briggs Pattern 40%
Combination Black 40&5%
Combination Bright 40%
Merrick Pattern 50%
Boardman's 33⅓%
Coes' Genuine Knife Hdl. 40&10&5&5%
Coes' Genuine Steel Hdl. 40&10&5&5%
Coes' Genuine Key Model. 40&10&5&5%
Coes' "Mechanics'" 40&10&10&5&5%
Donohue's Engineer 40&10%
Eagle 50&10%
Elgin Wrenches, ℔ doz. $6.25
Elgin Rethreading Attachment, ℔ doz. $6.25
Elgin Extra Dies and Jaws 50%
Gem Pocket 30%
Hercules 70%
W. & B. Machinist:
Case lots 50&5%
Less than case lots 50%
Improved Pipe (W. & B.) 60%
Solid Handles, P., S. & W. 50@50&5%
Stillson 65%
Vulcan Chain 50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ℔ gross, $7.50; ℔ doz. $0.80

Wrought Goods—

Staples, Hooks, &c., list March 17, '92 90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed 70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters' list net

Zinc—

Sheet per 100 lbs., $7.50@7.75